

ORDER

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AIRWAY FACILITIES CAREER PLANNING PROGRAM



APRIL 7, 1976

DEPARTMENT OF TRANSPORTATION FEDERAL AVIATION ADMINISTRATION

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RECORD OF CHANGES

DIRECTIVE NO.

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FOREWORD

1. PURPOSE. This order provides guidance and procedures for implementing and operating the Airway Facilities Career Planning Program. This program consolidates career guidelines in a single directive and describes career progression patterns in Airway Facilities.
2. PHILOSOPHY. The existence of a formal career system does not assure that all employees will automatically progress to the top of the career ladder. Progression is dependent on several factors, not the least important of which is individual self-development. This order serves as the guide by which employees can systematically plan their career development within Airway Facilities.
3. DISTRIBUTION. This order is distributed to branch level in Airway Facilities, and to division level in Offices of Budget, Civil Rights, International Aviation Affairs, Labor Relations, Personnel and Training, and Systems Engineering Management and to Airports, Air Traffic, Flight Standards, Logistics, and Systems Research and Development Services in Washington headquarters; to branch level in the Airway Engineering Support, Flight Standards, and Plant Engineering divisions; the Aircraft Services Base, the FAA Academy and Depot, and the Management Training School at the Aeronautical Center; to the branch level in the Aviation Facilities division and the Engineering Management Staff at the National Aviation Facilities Experimental Center (NAFEC); to branch level in all regional/center Personnel Management divisions; to branch level at overseas area offices; and a normal distribution to all Airway Facilities sectors and sector field offices.
4. ACTION. The career plans and procedures prescribed in this directive shall be implemented as soon as practical at all levels of the Airway Facilities organization. Program responsibilities are vested in appropriate offices of authority within the Airway Facilities Service, the regional Airway Facilities divisions, the Office of Personnel and Training, and regional and center Personnel Management divisions.
5. BACKGROUND. Order 3410.1, Career Planning Program, established the policy for career planning in FAA. Early in 1973, the Airway Facilities Service, recognizing the need for a realistic and viable career planning program, undertook jointly with the Office of Personnel and Training an intensive career study effort. The study team conducted interviews, evaluated other career systems, and sponsored a work group consisting of headquarters, regional office, and sector employees representing all major occupational groups within Airway Facilities. From the recommendations of the work group, the study team developed this directive.
6. DELEGATION OF AUTHORITY. The Director, Airway Facilities Service, is delegated authority to revise and update this order except on matters concerning policy, delegation of authority, and functional responsibilities. Revisions must be fully coordinated with the Office of Personnel and Training, regions and centers, and appropriate offices and services affected by such revisions.

4/7/76

7. POSITION CLASSIFICATION. This directive is not to be construed as a guide for position classification. Series and grade levels of positions cited in the text merely reflect existing Civil Service Commission, Department of Transportation, and FAA classification guidelines. They are included only as examples to assist employees in planning their careers within Airway Facilities. The directive will be updated to reflect changes in classification guidelines if, and when, they occur. In all cases, however, individual positions will be classified by the appropriate Personnel Management division on the basis of duties performed.



John L. McLucas
Administrator

TABLE OF CONTENTS

	<u>Page No.</u>
CHAPTER 1. INTRODUCTION	1
SECTION 1. GENERAL INFORMATION	1
1. Policy	1
2. Objectives	1
3. Coverage	1
4. Definitions	2
5. Equal Employment Opportunity	4
6. Training Programs	4
SECTION 2. PROGRAM ADMINISTRATION	6
7. Responsibilities	6
8. Career Counseling	9
9. Program Evaluation	9
10. Program Improvement	10
CHAPTER 2. CAREER SYSTEM FOR ENVIRONMENTAL SUPPORT OCCUPATIONS (RESERVED)	11
SECTION 1. WAGE GRADE ENVIRONMENTAL SUPPORT OCCUPATIONS (RESERVED)	11
11.-15. RESERVED	11
SECTION 2. ENGINEERING TECHNICIANS (GS-802)	18
16. General Characteristics	18
17. Career Goals and Opportunities	18
18. Career Progression	18
19. Occupational Requirements	19
FIGURE 2-4. ENGINEERING TECHNICIANS: CAREER PATTERNS	20
FIGURE 2-5. ENGINEERING TECHNICIANS: TRAINING PROGRESSION	21
CHAPTER 3. CAREER SYSTEM FOR ELECTRONICS INSTALLATION TECHNICIANS (GS-856)	23
20. General Characteristics	23
21. Career Goals and Opportunities	24
22. Career Progression	24
23. Occupational Requirements	26
24. Career Bridge to Maintenance	26
FIGURE 3-1. ELECTRONICS INSTALLATION TECHNICIANS: CAREER PATTERNS	27
FIGURE 3-2. ELECTRONICS INSTALLATION TECHNICIANS: TRAINING PROGRESSION	28
FIGURE 3-3. INSTALLATION-MAINTENANCE INTERFACE	29

	<u>Page No.</u>
CHAPTER 4. CAREER SYSTEM FOR ELECTRONICS MAINTENANCE TECHNICIANS (GS-856)	31
25. General Characteristics	31
26. Career Goals and Opportunities	31
27. Career Progression	32
28. Occupational Requirements	34
29. Maintenance-Installation Interface	34
FIGURE 4-1. ELECTRONICS MAINTENANCE TECHNICIANS: POSITION TITLES AND GRADES IDENTIFIED BY SECTOR TYPES	35
FIGURE 4-2. ELECTRONICS MAINTENANCE TECHNICIANS: CAREER PATTERNS TO THE JOURNEYMAN LEVEL	36
FIGURE 4-3. ELECTRONICS MAINTENANCE TECHNICIANS: CAREER PATTERNS BEYOND THE JOURNEYMAN LEVEL	37
FIGURE 4-4. ELECTRONICS MAINTENANCE TECHNICIANS: TRAINING PROGRESSION	38
FIGURE 4-5. ELECTRONICS MAINTENANCE TECHNICIANS: OCCUPATIONAL REQUIREMENTS	39
CHAPTER 5. PROFESSIONAL DEVELOPMENT PROGRAMS FOR AIRWAY FACILITIES TECHNICIANS	41
30. Introduction	41
31. Civil Service Commission Qualification Requirements	41
32. Policy and Procedures for Inservice Placement	43
33. Preparing Applications for State Board of Engineering Examiners	45
34. Preparing Form SF-171 for FAA/CSC Rating Panels	46
35. Engineer-In-Training Preparatory Course	47
36. Positions for Engineer Experience	48
37. Cooperative Engineer Development Program (CEDP)	49
38. Federal Aviation After-Hours College Program (FAACOP)	49
FIGURE 5-1. CIVIL SERVICE COMMISSION QUALIFICATION STANDARDS FOR ENGINEERING POSITIONS	50
CHAPTER 6. CAREER SYSTEM FOR AIRWAY FACILITIES ENGINEERS	51
SECTION 1. GENERAL INFORMATION	51
39. Introduction	51
40. Engineer Intern Program	51
41. Recruitment of Experienced Engineers	53
42. Career Opportunities	53
43. Location of Assignments	53

	<u>Page No.</u>
44. Professional Development Guidelines for Engineers	53
45. RESERVED	54
SECTION 2. CAREER SYSTEM FOR ELECTRONICS ENGINEERS (GS-855) AND GENERAL ENGINEERS (GS-801)	55
46. Introduction	55
47. Electronics Engineers (GS-855)	55
48. General Engineers (GS-801)	56
49. Career Progression for Electronics and General Engineers	56
FIGURE 6-1. ELECTRONICS ENGINEERS (GS-855) AND GENERAL ENGINEERS (GS-801): CAREER PATTERNS	59
SECTION 3. CAREER SYSTEM FOR CIVIL ENGINEERS (GS-810), MECHANICAL ENGINEERS (GS-830), ELECTRICAL ENGINEERS (GS-850), AND GENERAL ENGINEERS (GS-801)	60
50. Introduction	60
51. Civil Engineers (GS-810)	60
52. Mechanical Engineers (GS-830)	60
53. Electrical Engineers (GS-850)	61
54. Career Progression for Civil, Mechanical and Electrical Engineers	62
FIGURE 6-2. CIVIL ENGINEERS (GS-810), MECHANICAL ENGINEERS (GS-830), AND ELECTRICAL ENGINEERS (GS-850): CAREER PATTERNS	63
CHAPTER 7. CAREER SYSTEM FOR ENGINEERING SUPPORT PERSONNEL	65
SECTION 1. COMPUTER SYSTEMS ANALYSTS (GS-334)	65
55. General Characteristics	65
56. Career Goals and Opportunities	65
57. Career Progression	65
58. Occupational Requirements	66
FIGURE 7-1. COMPUTER SYSTEMS ANALYSTS (GS-334): CAREER PATTERN	67
SECTION 2. CIVIL ENGINEERING TECHNICIANS (GS-802) AND CONSTRUCTION REPRESENTATIVES (GS-809)	68
59. General Characteristics	68
60. Career Goals and Opportunities	68
61. Career Progression	69
62. Occupational Requirements	69
FIGURE 7-2. CIVIL ENGINEERING TECHNICIANS (GS-802) AND CONSTRUCTION REPRESENTATIVES (GS-809): CAREER PATTERNS	70

SECTION 3. ENGINEERING DRAFTSMEN (GS-818)	71
63. General Characteristics	71
64. Career Goals and Opportunities	71
65. Career Progression	71
66. Occupational Requirements	71
FIGURE 7-3. ENGINEERING DRAFTSMEN (GS-818): CAREER PATTERNS	72
CHAPTER 8. CAREER SYSTEM FOR FIELD SUPPORT OCCUPATIONS	73
SECTION 1. COMPUTER OPERATORS (GS-332)	73
67. General Characteristics	73
68. Career Goals and Opportunities	73
69. Career Progression	74
70. Occupational Requirements	74
FIGURE 8-1. COMPUTER OPERATORS (GS-332): CAREER PATTERNS	75
SECTION 2. FIELD LOGISTICS PERSONNEL (GS-2001 & GS-2005)	76
71. General Characteristics	76
72. Career Goals and Opportunities	77
73. Career Progression	77
74. Occupational Requirements	79
FIGURE 8-2. FIELD LOGISTICS PERSONNEL: CAREER PATTERNS	80
SECTION 3. FIELD MAINTENANCE PARTIES	81
75. General Characteristics	81
76. Career Goals and Opportunities	82
77. Career Progression	82
78. Occupational Requirements	82
FIGURE 8-3. FIELD MAINTENANCE PARTIES (FMP): CAREER PATTERNS	83
CHAPTER 9. CAREER SYSTEM FOR ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS	85
79. General Characteristics	85
80. Career Goals and Opportunities	86
81. Career Progression	86
82. Occupational Requirements	87
FIGURE 9-1. ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS: CAREER PATTERNS WITHIN FIELD SECTORS	88

FIGURE 9-2. ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS: CAREER PATTERNS AT REGIONAL OFFICES/CENTERS AND WASHINGTON HEADQUARTERS	89
CHAPTER 10. CAREER SYSTEM FOR TECHNICAL MANAGERS	91
83. Introduction	91
84. Career Development	91
85. Desirable Combinations of Experience	92
86. Ranking Factors for Selecting Technical Managers	93
87. Mobility Across Service Lines	95
FIGURE 10-1. TECHNICAL MANAGERS: CAREER PATTERNS	96
CHAPTER 11. INTERFACE OF AIRWAY FACILITIES CAREER SYSTEMS WITH THOSE IN OTHER ORGANIZATIONS	97
88. Introduction	97
89. Career Interface With the Aeronautical Center	97
90. Career Interface With NAFEC	98
91. Career Interface with the Airports Service	98
92. Career Interface with the Systems Research and Development Service	99
93. Career Interface with the Logistics Service	99
94. Career Interface with the Office of International Aviation Affairs	99
95. Career Interface with Other Offices and Services	100
96.-99. RESERVED	100
FIGURE 11-1. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE FAA ACADEMY: TECHNCIANS (GS-802 and GS-856)	101
FIGURE 11-2. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE FAA ACADEMY: GENERAL AND ELECTRONICS ENGINEERS (GS-801/855)	102
FIGURE 11-3. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND NAFEC AND BETWEEN AIRWAY FACILITIES AND THE AERONAUTICAL CENTER (EXCEPT FAA ACADEMY)	103
FIGURE 11-4. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE SYSTEMS RESEARCH AND DEVELOPMENT SERVICE AND BETWEEN AIRWAY FACILITIES AND THE AIRPORTS SERVICE	104

Page No.

FIGURE 11-5. CAREER INTERFACE BETWEEN AIRWAY FACILITIES ELECTRONICS TECHNICIANS AND THE LOGISTICS SERVICE QUALITY ASSURANCE SPECIALISTS	105
FIGURE 11-6. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE OFFICE OF INTERNATIONAL AVIATION AFFAIRS	106
APPENDIX 1. Career Inventory (1-11 pages)	1
APPENDIX 2. Glossary of Airway Facilities System Acronyms (1 page)	1

4/7/76

3410.12

CHAPTER 1. INTRODUCTION
SECTION 1. GENERAL INFORMATION

1. POLICY. This directive reaffirms agency policy to develop and utilize the talents of all employees to the optimum extent compatible with agency requirements. A well-planned and executed career development program is essential for effective manpower management. Procedures for carrying out career program objectives must be consistent with Civil Service Commission directives and the guidelines established by the FAA Career System Handbook, 3410.4A. All provisions of this directive are subordinate to, and support the primary objectives of the Airway Facilities organization. Although this directive is prepared for Airway Facilities employees, it may be used by employees in similar occupations throughout the FAA. Career opportunities shall be extended to all employees in accordance with directives issued by the FAA, the Department of Transportation, and the U.S. Civil Service Commission. Discrimination shall not be exercised because of race, color, sex, age, religion, national origin, physical handicap, political, or union affiliation.
2. OBJECTIVES. The following objectives are established for the Airway Facilities Career Planning Program.
 - a. Provide employees with information needed to intelligently plan their own careers in light of stated manpower and skills required and individual abilities and performance.
 - b. Encourage employees to pursue self-development activities.
 - c. Develop the variety of skills and knowledges required to effectively accomplish the mission of Airway Facilities.
 - d. Encourage supervisory personnel at all levels to assist employees in their career development efforts.
 - e. Provide interface with career systems in other services having similar occupations.
3. COVERAGE. Major Airway Facilities occupations which are covered by this directive are:
 - a. Environmental Support.
 - b. Field Maintenance Parties.
 - c. Electronics Installation.
 - d. Electronics Maintenance.

- e. Engineering.
- f. Engineering Support.
- g. Field Logistics.
- h. Technical and Administrative Support.
- i. Technical Management.

4. DEFINITIONS. The following terms are defined to facilitate a common understanding of the descriptive contents of this directive.

- a. Career System. Planned programs to attract, develop, and retain the quantity and quality of manpower needed for present and future operations. Provisions include specific means for recruiting, appraising, counseling, training, developing, and utilizing employees in a career field. The career system should foster skill development in accordance with agency needs and employee interests and abilities.
- b. Career Field. A group of jobs in one or more related occupational fields; e.g., electronics technicians career field, within which patterns of development and promotion are present, and which provide a range of grade levels sufficiently broad to offer long-term opportunities and incentives for personal development and advancement.
- c. Career Specialty. An area of specialization within a career field which affords progression opportunities to the supervisory level; e.g., radar, communications, nav aids, and environmental support systems career specialties.
- d. Career Development. The planned, organized, and systematic development of employees to improve performance in a career field through job assignments and training.
- e. Career Plan. A plan developed jointly by the employee and supervisor setting forth the employee's immediate and long-range goals, and the training and development assignments required to reach those goals.
- f. Career Levels. Grouping by a range of grade levels such as trainee, developmental, or journeyman for the purpose of providing a logical framework for overall training and development planning and progression within a career field.
- g. Occupational Mobility. Movement between career fields or specialties which requires additional training, proficiency development, and/or new job skills; e.g., technician reassignment from nav aids to radar, or electrical engineer to electronics engineer.

- h. Geographical Mobility. A personnel action involving a change in duty stations. Geographical mobility in terms of career planning, applies to career-broadening relocations within or between regions, and between regions and Washington headquarters.
- i. Functional Mobility. Movement between program areas or organizational elements that differs considerably in functions, operational procedures, and/or technical disciplines. For example, transferring from an F&E project engineer position to a maintenance evaluation officer position.
- j. Facility. A facility is the total electronic, electric power generating, and distribution system, and the structures used to house, support, and/or protect these systems.
- k. System. A system is an integrated combination of equipment or subsystems of an engineering design in which independent technical functions are combined to produce a particular facility in the overall system product. Examples of systems are: Airport surveillance radar (ASR), and instrument landing system (ILS).
- l. Subsystem. A subsystem is a segment of a system that performs a particular function, which is a portion of, or contributes to, the overall system output or product. Examples of subsystems are: the transmitter or receiver portion of a radar system, or the glide slope or localizer portion of an instrument landing system.
- m. Equipment. Equipment is a complete operating assembly within a system or subsystem.
- n. Complex Systems. Complex systems are those that require the highest technical skills and knowledge in analyzing, testing, diagnosing, and correcting defects or ensuring continuous and reliable operation. An example of a complex system is an air route surveillance radar (ARSR).
- o. Certification, Equipment. Certification is (1) technical verification that a system, subsystem, or equipment is providing required or advertised services to the user within established parameter tolerances; and (2) the insertion of the prescribed written entry in the official log, FAA Form 6030-1, Facilities Maintenance Log. Certification includes independent determination as to when a system or subsystem should be continued in, restored to, or removed from service.
- p. Certification, Personnel. Confirmation that the employee possesses the necessary minimum knowledge and skills to determine the operational status of a particular system, subsystem, or equipment.
- q. Precommissioning Certification. The technical verification by a qualified F&E (establishment) engineer or technician that a

4/7/76

system, subsystem, or equipment is capable of providing the required service to the user (Air Traffic personnel or aviation public). This is done following final alignment, tune-up and flight inspection (if applicable) and prior to the Joint Acceptance Inspection (JAI) and commissioning. It affirms that the key performance parameters are operating within the standards and tolerances prescribed in the specifications and design criteria and includes official documentation of all necessary parameters affecting system operation, and establishes system baseline data.

5. EQUAL EMPLOYMENT OPPORTUNITY. The Airway Facilities Service promotes equal employment opportunity through continuing affirmative action in all aspects of recruitment, placement, development, and promotion of employees. Programs have been established for women and minorities to improve career opportunities in the technical fields. Representative programs are:
 - a. The Predevelopmental Program has been established by the FAA to facilitate the recruitment of women and minorities in the electronics technician career field. Technicians are trained at the FAA Academy and at FAA facilities. Trainees receive basic electronics and engineering mathematics instruction at the FAA Academy with follow-on developmental training at Airway Facilities sectors.
 - b. Madera Training Program. The Bureau of Indian Affairs conducts a training program for American Indians, which is designed to qualify them for employment as electronics technicians and in electro-mechanical occupations in the FAA. American Indians placed in this program receive vocational, on-the-job, and apprenticeship training at the Madera Employment Training Center (METC) at Madera, California.
6. TRAINING PROGRAMS. The agency's requirements determine the extent of job-related training or development within each career field. The objective of the agency training program is to develop and improve job skills of employees in order to increase economy and effectiveness in the operation of agency programs. Training is provided based on availability of funds and in accordance with employee capabilities and interests.
 - a. Technical Training Programs. This is by far the largest area of training within Airway Facilities. More than eighty percent of Airway Facilities employees receive technical training based on the skills required in the various occupational groups. Electronics technicians require the longest and most intensive system and equipment training. An Airway Facilities electronics technician, on the average, will receive approximately one year of formal classroom training at the FAA Academy in Oklahoma City. Electronics engineers and environmental support technicians also receive considerable training at the FAA Academy and from out-of-agency sources. The FAA Academy administers a comprehensive directed study curriculum, which offers prerequisite courses for resident training. Certification and proficiency validation examinations

are part of the integrated training program. Most of the technical training is administered by the FAA Academy, although additional training is received out-of-agency and at contractor's facilities.

- b. Supervisory and Management Training. The Management Training School at Lawton, Oklahoma, provides training for supervisors and management personnel. Among the more prominent courses taught at Lawton are:

- (1) Supervisory Training Course.
- (2) Managerial Training Course.
- (3) Labor Relations for Management.
- (4) EEO Counselor Effectiveness Course.

- c. Long-Term Training Programs. Long-term training programs are periodically offered to agency employees who have demonstrated a high potential to perform successfully in key agency positions. Competition is extremely keen, and selection for these higher educational programs is made under competitive promotion procedures. The various programs and sponsors are:

- (1) Education for Public Management: Civil Service Commission.
- (2) Air Transportation Systems Development Program: Federal Aviation Administration.
- (3) Career Program for Federal Officials at Mid-Career: Princeton University.
- (4) Senior Service Schools:
 - (a) Air War College: U.S. Air Force
 - (b) Industrial College of the Armed Forces: Department of Defense.

- d. Self-Development Programs.

- (1) Career opportunities will be greatly enhanced for those employees who establish and pursue self-development programs. Technology is advancing much too rapidly for individuals in technical fields to maintain currency through work experiences alone. It is becoming more important for technical personnel to expand their skills and knowledge. Employees in nontechnical occupational groups can increase their career opportunities by pursuing managerial and specialized courses that meet specified educational requirements in higher-skilled career fields. Self-development programs can be pursued and accomplished by enrollment in:
 - (a) Colleges and universities.

4/7/76

- (b) College-level correspondence courses.
 - (c) FAA directed study courses.
 - (d) Vocational schools.
- (2) Recommended subject areas for study are: engineering, electronics, data processing, system design and analysis, statistics, engineering management, and business and public administration.
- (3) Enrollment in after-hours schools and colleges may involve adjusting individual employee work schedules. The FAA has always pursued this policy whenever manpower and workload considerations permit. However, the agency's mission and responsibility to the public must remain paramount, and work schedules may not be adjusted in every case. Correspondence courses can be pursued in all cases.

SECTION 2. PROGRAM ADMINISTRATION

7. RESPONSIBILITIES. The career planning program shall be administered by assigning responsibilities to all levels throughout the Airway Facilities Service, the regional Airway Facilities divisions, within the Office of Personnel and Training, and region/center Personnel Management divisions.
- a. The Airway Facilities Service shall:
- (1) Identify the kinds of skills and knowledge that are needed in Airway Facilities today, and in the future.
 - (2) Develop realistic career paths within the organization that will provide maximum opportunities for career progression through training, job assignment, and self-development.
 - (3) Ensure that employees are informed of existing job qualifications for Airway Facilities positions.
 - (4) Evaluate the effectiveness of career planning activities through periodic surveys, review of reports, and other data.
 - (5) Foster a working environment conducive to career development for all employees.
 - (6) Initiate changes to the career planning program as required.
- b. The Office of Personnel and Training shall:
- (1) Provide advisory services and technical staff assistance in the implementation of this directive.

- (2) Assist in the conduct of appraisals of the career planning program through special surveys and personnel program evaluation procedures.

c. Regional Airway Facilities divisions shall:

- (1) Implement policy, procedures, and other program requirements for Airway Facilities career planning activities.
- (2) Provide necessary staff assistance and guidance to assure maximum understanding of, and participation in, the career planning program by both supervisors and employees.
- (3) Evaluate the status of operation and effectiveness of the career planning program within their jurisdictions.

d. Personnel Management divisions shall:

- (1) Advise and assist functional line managers in the application of the career program to achieve more predictable results in the intake, development, and utilization of human resources.
- (2) Be responsible for the integration of the intake, career planning, and employee development aspects of the Airway Facilities Career Planning Program with the FAA Career System.

e. Airway Facilities branch chiefs/sector managers shall:

- (1) Be responsible for execution of the career development program.
- (2) Ensure that development programs are consistent with the organization's program requirements.

f. Second level supervisors shall:

- (1) Provide employees with all available information on the Airway Facilities Career Program.
- (2) Keep current on changes to agencywide training programs and ensure that changes are integrated into each employee's career progression plan. Ensure that each employee is aware of significant changes to training programs.
- (3) Provide direct assistance in the training and development of employees assigned to the organization under a specified career program, e.g., engineering interns.

- (4) Monitor the effectiveness of the career development program within their jurisdiction. Assist and counsel subordinate supervisors in efforts to resolve unusual case problems resulting from or relating to the career program.
- (5) Be responsible for monitoring and directing employee's long-range career goals by recommending realistic progression paths.

g. First level supervisors shall:

- (1) Identify employee development needs and assist the individual in satisfying those needs.
- (2) Develop jointly with the employee a career progression plan tailored to the desires of the individual and the needs of the organization. Ensure that the employee is notified of any change to that plan.
- (3) Counsel with the employee on individual performance and recommend changes to the employee's career goals as necessary.
- (4) Encourage subordinates to improve their performance through systematic and continuous self-development.
- (5) Provide adequate on-the-job training for the employee and assure that this training is realistic and reasonable in cost.
- (6) Counsel the employee prior to the beginning of training with regard to agency policy, course objectives, desired course outcomes, etc.
- (7) Make use of Form DOT F 3430.1, Performance Evaluation Record, Part V, to indicate training or self-development needs.
- (8) Where possible, restructure positions to enhance opportunities for upward mobility.

h. Airway Facilities Employees shall:

- (1) Establish their career goals by realistically evaluating existing career avenues and qualification requirements for each successive level leading to their goals.
- (2) Be responsible for keeping current with all program directives related to their work environment and career possibilities.

- (3) Pursue self-development activities in addition to training provided by the agency.
- (4) Seek counseling and guidance as needed.

8. CAREER COUNSELING.

- a. Importance. Effective counseling is fundamental to the success of the career planning program. The supervisor must clearly communicate developmental needs to the employee, how and when development will take place, and what is expected of the employee in the development process.
- b. Process.
 - (1) Responsibility. First level supervisors are responsible for counseling their subordinates. Counseling efforts may be augmented by the second level supervisor.
 - (2) Frequency. Formal career counseling shall, as a minimum, be conducted annually for all Airway Facilities employees. This is especially important for employees at the trainee level.
 - (3) Counseling Session. This should be an open and frank dialogue in which employee goals are discussed concerning technical qualifications, job performance, training needs, mobility, and opportunities for advancement.
 - (4) Follow-Up Action. Supervisors must take necessary follow-up action to assist employees in reaching their career goals. For their part, employees should avail themselves of all developmental opportunities which are offered.

9. PROGRAM EVALUATION. The success of a career planning program depends largely on the support given to implementing its objectives. This is accomplished by effectively evaluating the program operation. Systematic approaches for measuring program effectiveness will be carried out by:

- a. National Evaluations. The Airway Facilities Service will periodically evaluate the major aspects of the AF career system and the degree of program achievement at all organizational levels.
- b. Regional Evaluations. Regional Airway Facilities divisions are encouraged to conduct periodic evaluations of career programs within their jurisdictions, and report their findings and recommendations to the national level.

- c. Committee Review. The Airway Facilities Service and the Office of Personnel and Training may sponsor committees to review program effectiveness. Committee membership will include representatives from headquarters and regional Airway Facilities and Personnel Management divisions. Committee membership, agenda items, procedures, time and place of meeting, and duration of assembly will be announced well in advance.
10. PROGRAM IMPROVEMENT. The Airway Facilities Service, in coordination with the Office of Personnel and Training will initiate program changes when required. Evaluation results will be analyzed in terms of fiscal capability and system requirements. Career inventory data will be updated on a two-year basis and will be analyzed to detect trends of skills imbalance, manpower shortages, retraining requirements, etc. Appendix 1 provides career inventory information by showing the total number of employees in each occupational area (job classification series), and provides career specialization and occupational profiles as distributed among the regions and Washington headquarters.

4/7/76

3410.12

CHAPTER 2. CAREER SYSTEM FOR ENVIRONMENTAL SUPPORT OCCUPATIONS

SECTION 1. WAGE GRADE ENVIRONMENTAL SUPPORT OCCUPATIONS.

11.-15. RESERVED

NOTE: These positions currently are classified in the WG-4740 series. This series has been cancelled by the Civil Service Commission (CSC) and a review is now in progress for reclassifying these positions to new CSC job grading standards. This section will be added when the agency has completed this review and after the reclassification action has been completed.

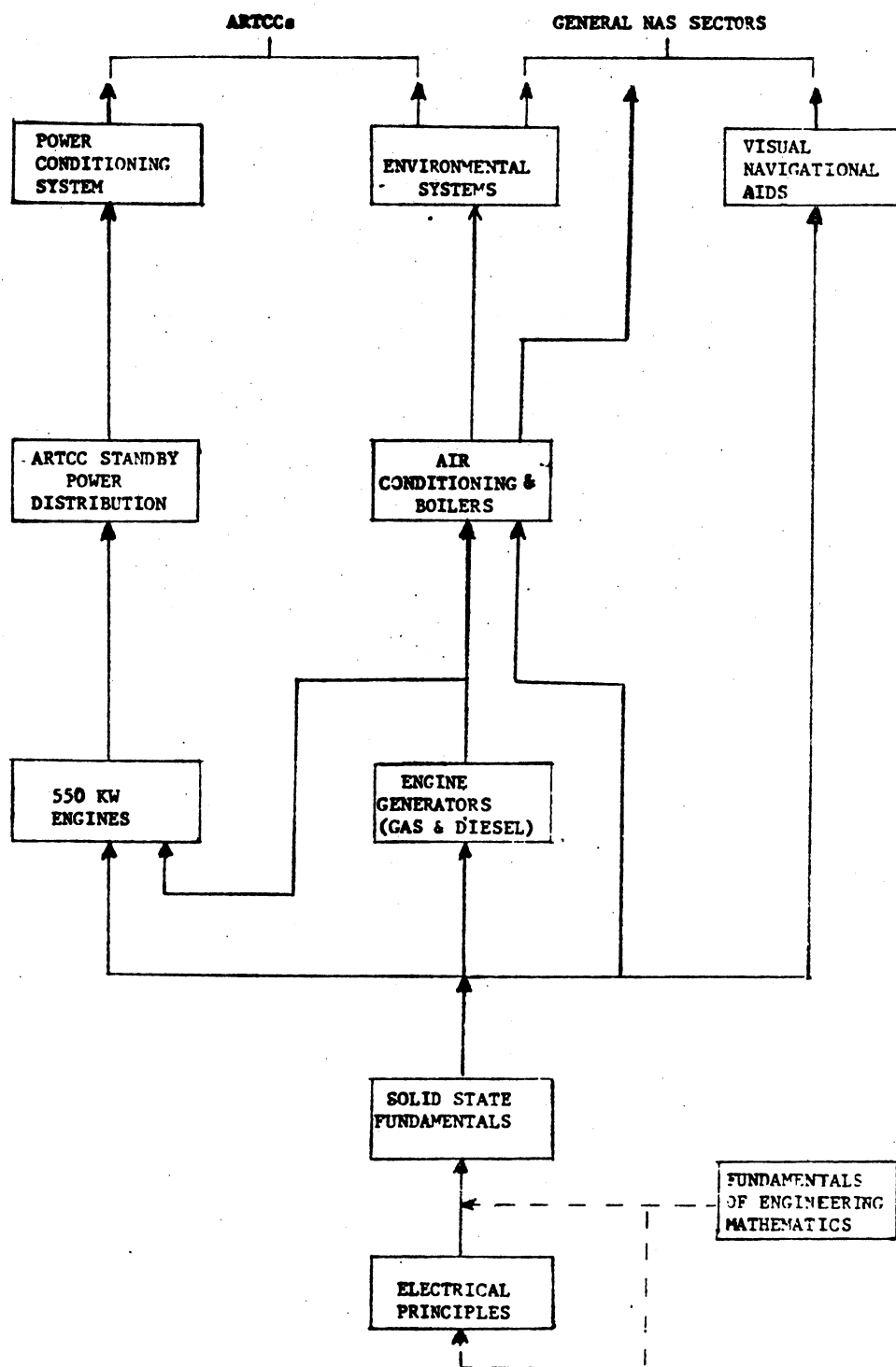
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SECTION 2. ENGINEERING TECHNICIANS (GS-802)

16. GENERAL CHARACTERISTICS. Engineering technicians comprise approximately one-third of the environmental support system work force. They are responsible for the maintenance of complex electronic and electro-mechanical systems located at ARTCC's, airport terminals, and at facilities serving large automation complexes. Engineering technicians perform essential maintenance on these systems and initiate corrective action which leads to full operational capability. They maintain integrated systems including power generating plants and power conditioning systems. The scope and depth of knowledge and skills required in this field are continually increasing. Electronic control and monitor systems are becoming standard design features in the newer environmental support systems.
17. CAREER GOALS AND OPPORTUNITIES. Engineering technicians have excellent career growth opportunities in Airway Facilities. Environmental systems have become more complex in design and more important to multisystem operation. Thus, increased skill and responsibility levels make this a challenging occupational field. Engineering technicians can attain GS-11 journeyman positions through progressive training and experience. For progression beyond the GS-11 grade level, technicians must qualify for one of the engineering disciplines utilized in Airway Facilities (see Chapter 6). In addition, the FAA Academy offers GS-11 and GS-12 instructor assignments for engineering technicians (see Chapter 11).
18. CAREER PROGRESSION. (See Figure 2-4.) Progression in this occupational field ranges from GS-3 to GS-11. General educational experience and training must be completely satisfied at each successive grade level. Vacancy announcements will specify qualifications, occupational and responsibility requirements for positions at all grade levels.
 - a. Entry Level (GS-4/5/7). The primary recruitment level is GS-7. Some recruitment will occur at lower-grade levels to accommodate:
 - (1) Inservice placement of qualified Wage Grade personnel.
 - (2) Qualified candidates from junior colleges and vocational trade schools.
 - b. Traditional recruitment sources for engineering technician positions have been:
 - (1) The Civil Service Commission register.
 - (2) Transferees from other Federal agencies.
 - (3) Selection of Wage Grade candidates within Airway Facilities.

- c. Establishment of Engineering Aid Positions (GS-3). With the implementation of this directive, regions may supplement this intake by establishing GS-802-3, Engineering Aid positions in the field. In effect, this will create a developmental pipeline of GS-802 trainees which will alleviate problems created when outside candidates are not available. Moreover, it will provide a "career bridge" for those Wage Grade employees who are interested in GS-802 positions but do not yet meet the specialized experience qualifications required for the engineering technician. Engineering aids will subsequently progress into trainee engineering technician positions at the GS-4/5/7 level.
 - d. Trainee Progression (GS-4 to GS-9). As in the case of the engineering aid, this level may be used as a means of providing career progression for Wage Grade employees. At these levels, however, specialized experience is required for selection. Trainees are expected to acquire experience within the disciplines expected of engineering technicians. FAA Academy and on-the-job training will involve systematic approaches to problem solving, interpretation of test measurements such as waveform analysis, and conceptual learning of interrelated components. Satisfactory progress during this phase of development will lead to promotion to GS-9 when all training and performance requirements are met. Promotions are subject to budgetary and other administrative restrictions. See Figure 2-5 for a general training progression pattern.
 - e. Journeyman Progression (GS-9/11). Progression to GS-9 affirms sufficient technical competency for assuming full maintenance duties and responsibilities at the subsystem level of complexity. Technicians must be skilled in interpreting measured test data which leads to proper conclusions and diagnosis of equipment performance. Promotion to GS-11 is competitive, and selected technicians must be fully proficient on the major systems within their assigned area and be capable of rapidly identifying and isolating system failures. Technicians must be capable of assuming full watch responsibility. They must be able to determine when a system or subsystem should be continued in, restored to, or removed from service.
19. OCCUPATIONAL REQUIREMENTS. Technicians are required to work both in centralized and dispersed field operations. However, most positions are located at ARTCC's and major airport terminals. At these locations, technicians are required to work rotating shifts. They are required to maintain high-voltage power systems and powerful electro-mechanical devices. At dispersed locations, they are required to perform more outside activities such as working on towers and structures. Certification is required for technicians who maintain complex systems. In most cases, engineering technicians are required to be licensed drivers. Entrance medical examinations and security clearances are additional requirements for engineering technicians.

FIGURE 2-5. ENGINEERING TECHNICIANS; TRAINING PROGRESSION.



CHAPTER 3. CAREER SYSTEM FOR ELECTRONICS INSTALLATION TECHNICIANS (GS-856)

20. GENERAL CHARACTERISTICS. The facilities and equipment (F&E) electronics work force is responsible for establishing, relocating, modernizing, commissioning, and decommissioning complete or partial electronic systems and facilities. Facility establishment and modernization embraces a full range of diverse skills and knowledge in electronics installation. Project assignments are under tight fiscal and time constraints, thus requiring optimum job efficiency and prudent use of resources.

a. Important job functions and duties are:

- (1) Installing new systems and making major modifications to existing systems.
- (2) Tuning equipment and aligning systems to meet or exceed initial operating standards and tolerances.
- (3) Performing interface checkout with other systems and facilities.
- (4) Analyzing systems for operational capability in terms of intended use and service.
- (5) Completing Joint Acceptance Inspection (JAI) with Air Traffic and/or Flight Standards personnel, as well as with AF maintenance and other F&E personnel
- (6) Serving as Contract Office Technical Representative (COTR).
- (7) Assuring system capability through precommissioning certification action.

- b. Work Environment. In many instances, technicians will work on installation projects at facilities that have yet to be commissioned. Therefore, they may be required to work without heat or air conditioning, water, plumbing, or other comforts. Technicians must also be in good physical health for climbing, lifting, and working under varied environmental conditions. During outside activities, they install antennas and transmission lines, splice and check control cables, install cable supports, measure field intensities, and perform other essential installation duties.

- c. Nature of Work. Assignments generally require frequent travel throughout the region. Generally, project assignments range from one week to six months. Work assignments are located at large terminals, ARTCC's, and at smaller remote facilities. Technicians are required to adapt to varying work situations. In some instances, work on commissioned facilities will require that these technicians coordinate with Airway Facilities sector

maintenance, air traffic, and airport personnel. They also coordinate and monitor work with private contractors. Installation at remote sites requires a great deal of self-sufficiency because of project independence and the work environment. Installation technicians normally work day shifts. In some instances, they are required to perform essential activities at night during periods of minimum traffic activity when those activities involve interface with, or modification to, operational systems.

21. CAREER GOALS AND OPPORTUNITIES. Installation technicians can pursue their career goals within the primary specialty fields of radar, nav aids, and communications. They may also be trained and assigned installation projects on automated systems. They can attain the GS-11 journeyman level by achieving full performance capability in one primary specialty field. Normally, technicians will be trained in combined specialties such as radar/communications, nav aids/communications, and radar/automation. Dual specialization allows optimum utilization of manpower during periods of fluctuating F&E program requirements in the various specialty areas. Formal training for installation technicians will be provided to assure full performance capability in a primary specialty area. Training will be provided to meet certification requirements in all career specialty areas. Installation technicians will receive sufficient training to bid competitively on vacancies in the maintenance career field. Additional career opportunities are available at the FAA Academy, and in other services which employ electronics technicians.
22. CAREER PROGRESSION. (See Figure 3-1.) There is equal progression opportunity to the GS-11 journeyman level in each of the three major career specialty areas. First line supervisory GS-12 positions form the top of the career ladder in the establishment career field.
 - a. Entry Level (GS-4/5/7). The primary recruitment level is GS-7; however, exceptionally well-qualified candidates may enter at higher grades. The secondary recruitment level is GS-5, and below.
 - b. Trainee Progression (GS-4/5/7). Trainees are initially assigned as helpers on establishment projects. During the first six months of employment, they will be given accelerated on-the-job training (OJT) and will be required to enroll in specified directed study courses. Formal FAA Academy training will be assigned when trainees demonstrate adequate preparation through directed study and OJT. At the GS-4 and GS-5 grade levels, trainees must complete the directed study course in Electronic Fundamentals and Engineering Mathematics. In addition, they will be assigned to the Facility Installation Course. (This course may be waived, depending upon the individual's experience in establishment.) Trainees at these grades must contribute productive work on assigned projects. At

the GS-7 level all trainees will be assigned to one of the primary career specialty fields of radar, communications, or nav aids. Technicians may be assigned projects outside their specialty area, depending upon program requirements and manpower needs. They will receive additional training at the FAA Academy in advanced specialty courses; e.g., communications equipment, vhf omnirange (VOR), instrument landing system (ILS), air route surveillance radar (ARSR), automation systems, and other equipment courses as required. After they complete advanced training, technicians will be assigned to projects within their specialty field. Technicians at the GS-7 grade level must be fully capable of reading blue prints and schematics, performing complex interrack, rack, cabinet, and main-frame wiring, and performing analysis, corrective maintenance, tuning, and alignment, and modifications on units of equipment and subsystems. Promotion to GS-9 will be noncompetitive, provided all training and performance requirements are satisfied. Promotions are also subject to budgetary and other administrative restrictions.

- c. Journeyman Progression (GS-9/11). Progression to the GS-9 level affirms full performance capability on electronic systems of lesser complexity and on subsystems of highest complexity. At the GS-9 level, technicians will be assigned to a variety of projects as installation team members. They will be required to accomplish all establishment activities on subsystems of the highest complexity; e.g., air route surveillance radar (ARSR), instrument landing system (ILS), etc. They will be required to diagnose system failures and malfunctions, repair and restore the inoperative circuits or out-of-tolerance conditions, and tune and align the system to meet initial standards and tolerances. At this level, technicians may be assigned training in a second specialty. Automation training may be required depending upon regional needs. The scheduling and timing of additional training will depend upon program responsibilities, availability of training funds, and school quotas. Promotion to GS-11 journeyman positions will be on a competitive basis. At the GS-11 level, technicians will be expected to assume full project responsibility on complex system installations, although they may continue to be assigned as team members, depending on the F&E program and manpower requirements. Installation technicians at the GS-11 grade level must be capable of performing the most complex circuit analysis, system diagnosis, and troubleshooting. Full system alignment, and system-interface checkout capabilities are expected at this level. Technicians assigned as crew chiefs should have certification credentials (or interim certification) on the system assigned.
- d. Supervisory Positions (GS-12). Technicians at this grade are required to supervise installation teams on one or more major complex systems. They are responsible for all project installation activities at the job site. This includes effective management of

all available resources assigned and/or allocated to the project. Progression to supervisory positions requires a high degree of knowledge and application of skills in the establishment function. Technicians at this grade must be fully qualified to lead a project of the highest complexity from beginning to end, and must have certification credentials on a highly complex system.

23. OCCUPATIONAL REQUIREMENTS. These requirements focus primarily on the specialized training and experience needed to perform the job. Employees in the installation field will be required to satisfactorily complete all training required to perform their duties at each level. This required training can be considered a career opportunity for the individual as training becomes a means for developing skills and for advancing to jobs of higher responsibility. Figure 3-2 describes the general training pattern for installation technicians. Installation crew chiefs who independently prepare a system for precommissioning certification must have demonstrated their level of proficiency on the assigned system. Normally, this proficiency will be confirmed by certification credentials acquired through the Airway Facilities Maintenance Personnel Certification Program (see Order 3400.3). Other occupational requirements include an entrance medical examination, security clearance, and a vehicle operating license.
24. CAREER BRIDGE TO MAINTENANCE. (See Figure 3-3.) There are many benefits to both the agency and to the individual which can be derived by movement of technicians between installation and maintenance. Such interchange develops within Airway Facilities a group of electronics technicians with a broad base of technical skills and knowledge. For installation technicians, movement into maintenance also offers greater career opportunities that are due to the vastly greater size and scope of the maintenance organizational structure. Occupational mobility between installation and maintenance shall be accomplished under existing merit promotion procedures, or through reassignments by the regional AF and Personnel Management divisions.

4/7/76

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FIGURE 3-1. ELECTRONICS INSTALLATION TECHNICIANS: CAREER PATTERNS.

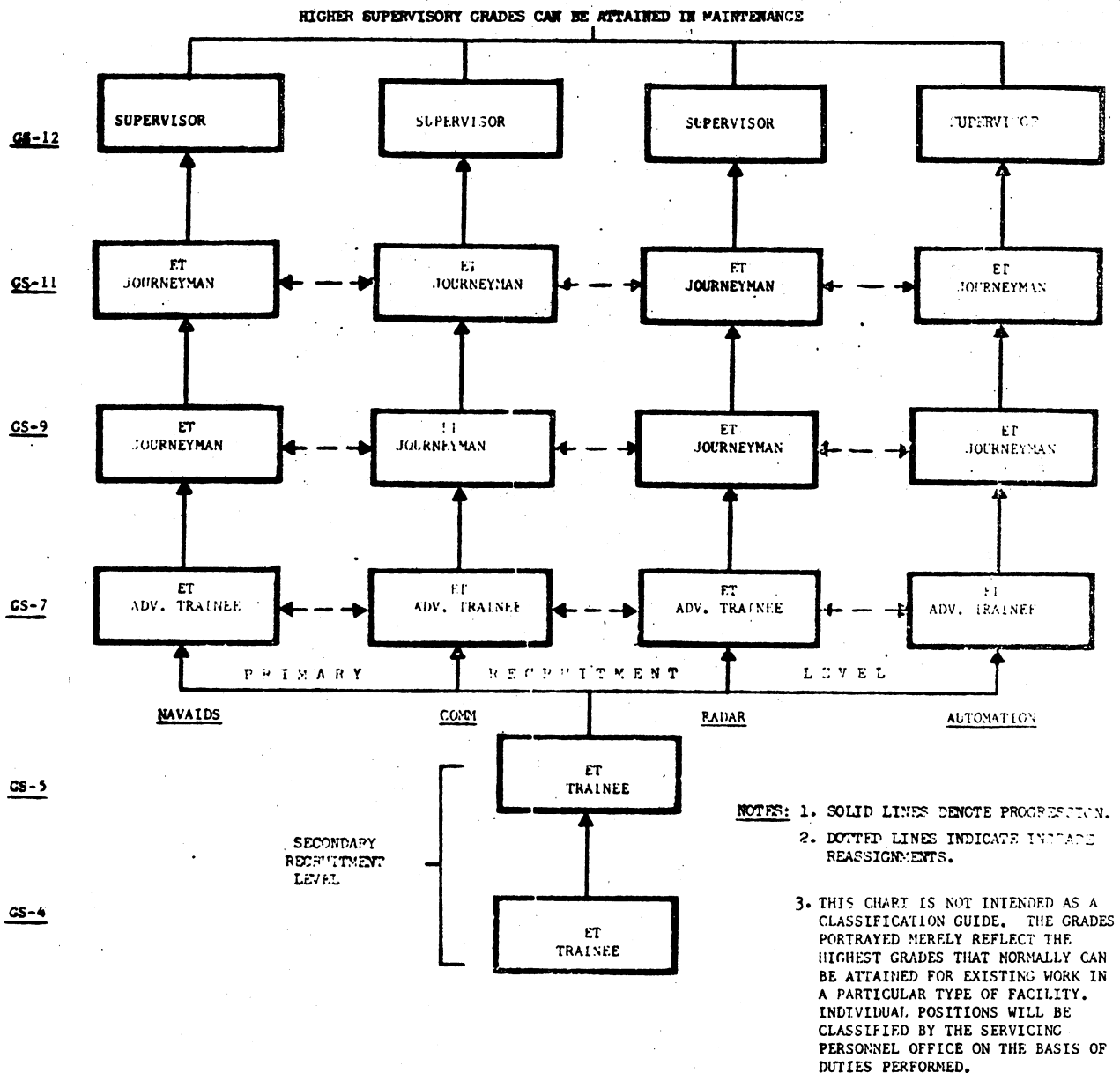


FIGURE 3-2. ELECTRONICS INSTALLATION TECHNICIANS: TRAINING PROGRESSION.

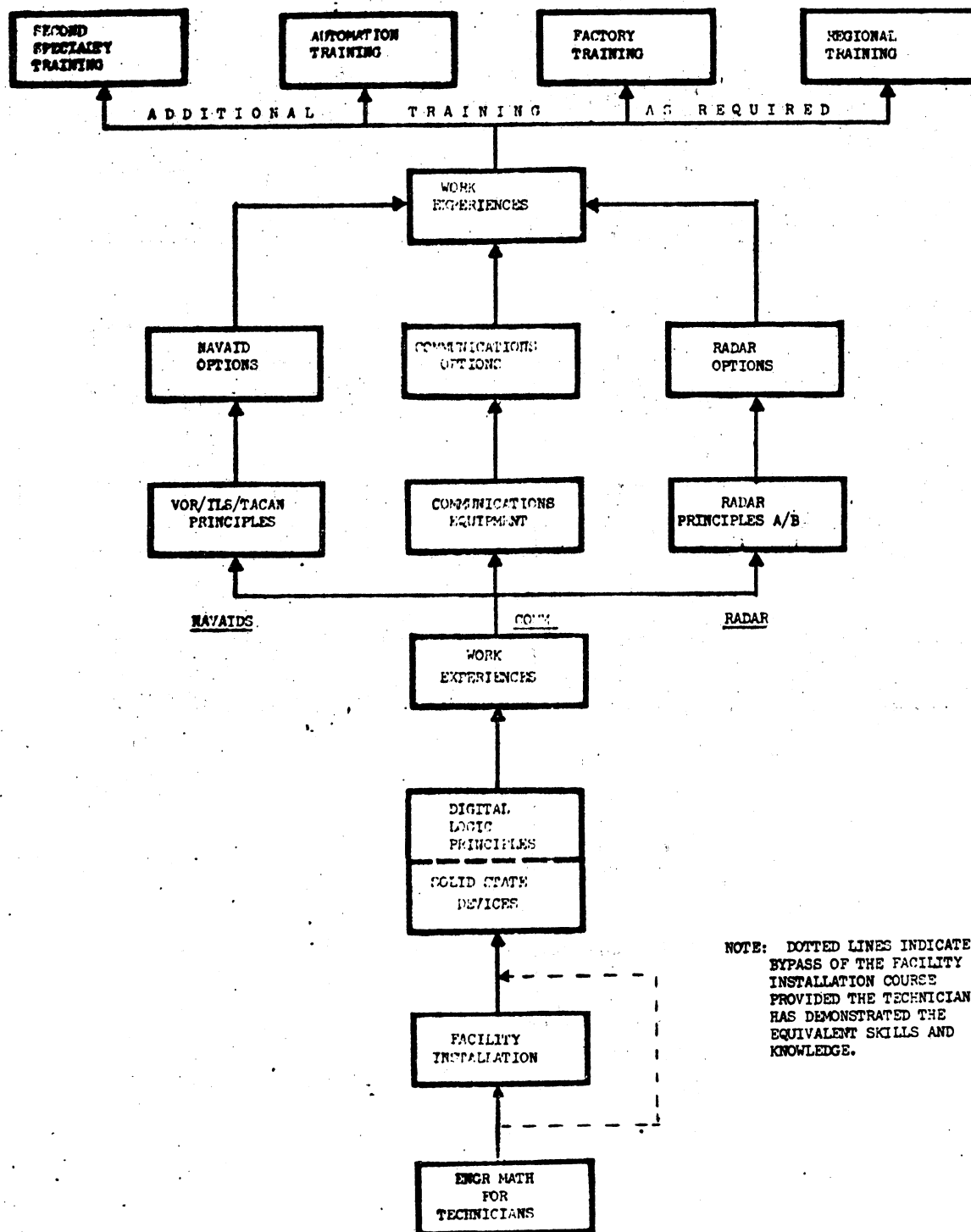
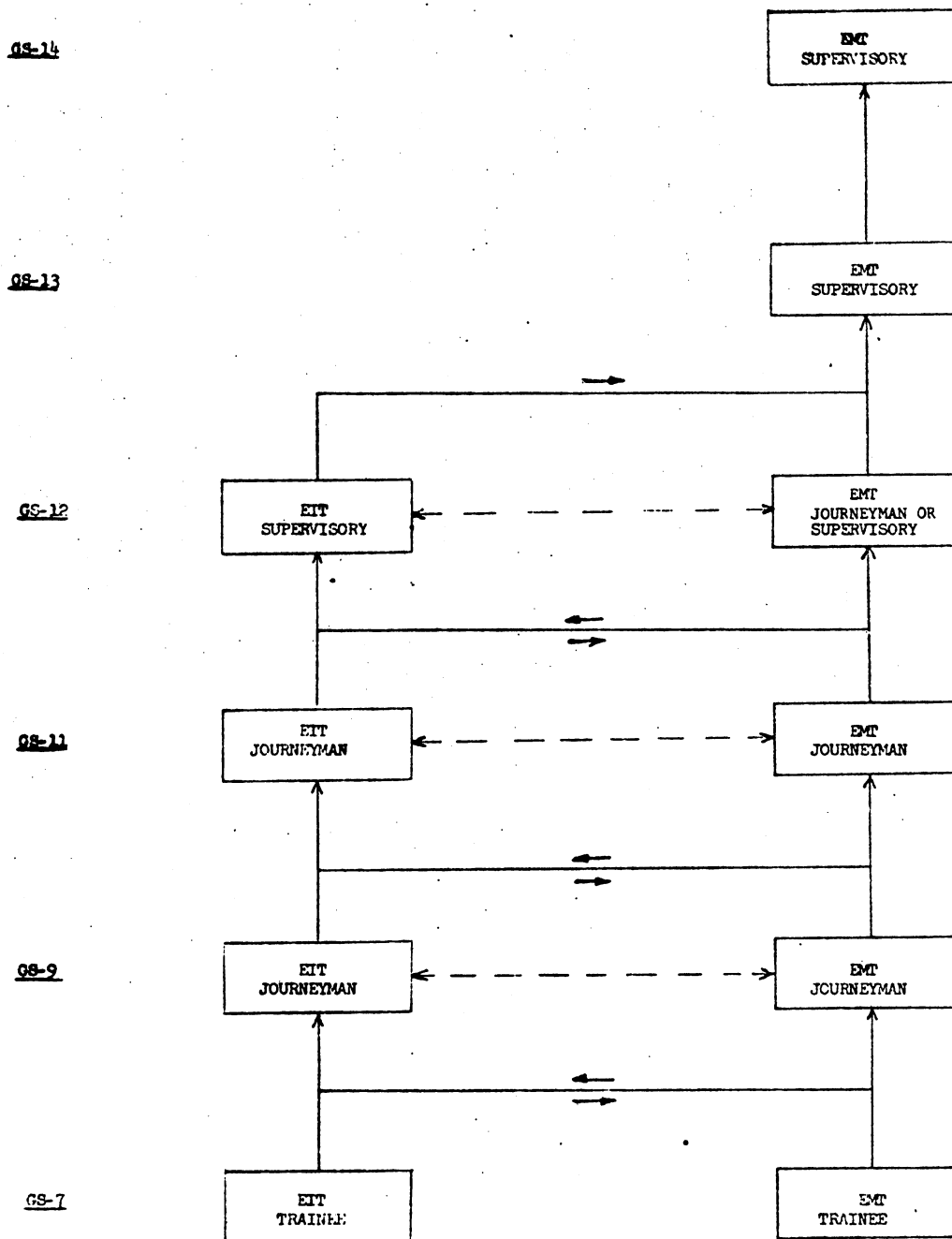


FIGURE 3-3. INSTALLATION - MAINTENANCE INTERFACE.



ELECTRONICS INSTALLATION
TECHNICIANS (EIT)

ELECTRONICS MAINTENANCE
TECHNICIANS (EMT)

- NOTES:**
1. SOLID LINES DENOTE UPWARD MOBILITY UNDER MERIT PROMOTION PROCEDURES.
 2. DOTTED LINES INDICATE IN-GRADE REASSIGNMENTS.
 3. IN-GRADE REASSIGNMENTS MAY BE ACCOMPLISHED BELOW THE GS-11 GRADE LEVEL DEPENDING UPON MANPOWER REQUIREMENTS AND CAREER REASSIGNMENT REQUESTS.
 4. THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES THAT NORMALLY CAN BE ATTAINED FOR EXISTING WORK. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE ON THE BASIS OF DUTIES PERFORMED.

CHAPTER 4. CAREER SYSTEM FOR ELECTRONICS MAINTENANCE TECHNICIANS (GS-856)

25. GENERAL CHARACTERISTICS. Electronics maintenance technicians constitute over two-thirds of the total Airway Facilities workforce. These highly trained technicians assure the continuing service of the vast network of complex electronic systems comprising the National Airspace System (NAS). These systems include communications, radar, nav aids, and automation complexes. Technicians maintain these complex systems through evaluation and analysis, and by initiating preventive and corrective maintenance actions. They continually monitor and evaluate system operation, functions, and parameters. They are required to rapidly restore system elements that are found to be out-of-tolerance or inoperable. Certification responsibility requires technicians to fully document their activities following corrective and routine maintenance. Official logs, equipment and operation records must accurately reflect all pertinent technical activities and system certification.
- a. Work Environment. The work environment varies with the work location. At large centralized facilities, technicians will usually work in modern, air-conditioned areas. At dispersed locations, technicians perform additional duties such as repairing or adjusting antennas and transmission lines, and measuring radiation intensities. This work may involve climbing towers and structures, and working outside during inclement weather.
- b. Nature of Work. Assignments vary considerably in terms of location, size of unit, types of equipment and systems, hours of duty, job requirements and geographic coverage. At highly centralized locations, more than one hundred technicians carry out their duties at one facility; e.g., ARTCC. This type of facility, like the larger metropolitan hub terminals, requires 24-hour maintenance coverage. Technicians at these facilities are responsible for all maintenance activities on rotating shifts. At smaller, decentralized locations, technicians normally will work day shifts and will be subject to callback duty after normal working hours to restore critical facilities. These types of facilities are found in a wide variety of locations ranging from small terminals, radars, and en-route nav aids. Work at some remote radar sites requires unique watch coverage and deviations from normal duty hours and assignments. See Figure 4-1 for a list of positions at various locations throughout the Airway Facilities sector organization.
26. CAREER GOALS AND OPPORTUNITIES. Maintenance offers highly challenging and rewarding careers in five distinct specialty areas. Each of the specialty areas is sufficiently broad and challenging to offer technicians equal progression opportunities to the journeyman level in their chosen field. Specialization also significantly reduces agency training costs.

a. Specialty areas are:

- (1) Communications.
- (2) Navigational Aids.
- (3) Radar.
- (4) Terminal Automation.
- (5) En Route Automation.

b. Assignment in a primary specialty. Assignment will be based upon the needs of the agency, previous experience and training, and the desires of the employee. The area of primary specialization shall be identified early in the technician's career so that developmental training can be programmed. The employee should be given sufficient time to become familiar with the various specialties before final career decisions are made.

c. Additional career avenues and opportunities. Such opportunities are available by assignments to the F&E Program and selection for positions in other Services and organizations such as NAFEC Airway Facilities and the FAA Academy. See Chapter 11.

27. CAREER PROGRESSION. (See Figures 4-2 and 4-3). Technicians can progress to the GS-11 journeyman grade level in each of the five areas of specialization. However, progression to the GS-12 level is dependent upon assignments to supervisory positions or to facilities with systems of higher complexity such as ARTCC's and major terminals. Highly qualified journeyman technicians can progress beyond the GS-12 level by selection for supervisory, technical staff, and management positions.

a. Entry Level (GS-3/4/5/7). The primary recruitment level is GS-7; although exceptionally well qualified candidates may enter at higher grades. The secondary recruitment level is GS-5. Recruitment at the GS-3/4 level may be used for intake of individuals who lack specialized experience required at the higher grade levels.

b. Trainee Progression (GS-4/5/7). After orientation, trainees will be assigned to field organizational elements and placed in accelerated training and proficiency development programs. At the GS-4/5 grade levels, approximately one-half of the employee's time will be spent in some phase of training; e.g., directed-study, on-the-job, and formal FAA Academy training. The advancement rate depends on training progress and demonstrated job performance.

Normally, trainees must complete the directed study course in Basic Electronics and Engineering Mathematics. In addition, other directed study courses may be assigned. At the GS-7 level, technicians will select or be placed in a distinct career specialty (this may be determined earlier in the development program). Technicians will receive additional training at the FAA Academy in advanced specialty courses; e.g., communications equipment, VHF omnirange (VOR), principles of ILS and other courses as required. Trainees may be noncompetitively promoted to GS-9 provided they meet all training and performance requirements. Promotions are also subject to budgetary and other administrative restrictions.

- c. Journeyman Progression (GS-9/11/12). Progression through the journeyman grade levels will be based on competition under the Merit Promotion Program. The journeyman, or full performance level, is a significant career milestone for maintenance technicians. At this level, (GS-9 or GS-11) they must become fully qualified to maintain and certify at least one complex electronics system. Technicians at this level and above must be capable of rapid identification, isolation, and correction of system malfunctions. At the GS-12 level, journeyman technicians are responsible for maintaining and certifying two or more complex electronic systems serving major terminals and ARTCC's, or one extremely large complex system, e.g., the central computer complex (CCC). Opportunities are available in the automation specialties for systems analysis and maintenance of computer operational and diagnostic programs. These positions are located in the Systems Performance Office and generally are classified at the GS-11 and GS-12 grade levels.
- d. Supervisory/Technical Staff (GS-11 through GS-14). Grades of these positions are determined by duties and responsibilities of the job and/or the level of the work supervised. Diversity of technical experience and managerial potential are important factors in selecting supervisory personnel. At general NAS sector facilities, such as Levels I and II terminals, Flight Service Stations, and at facilities serving small airports, supervisory personnel are normally GS-12's. Further progression to the GS-13 level can be achieved in positions such as AF watch supervisors at larger general NAS sectors, crew supervisors at ARTCC sectors, and System Performance Officers (SPO's). Chiefs of sector field offices (SFO's) are classified at grades GS-12 through GS-14 depending upon size of the SFO, complexity of systems, and the level of responsibility exercised. Competition for maintenance supervisory and staff positions is very keen at all levels.

- e. Progression to Sector Manager/Assistant Sector Manager Positions (GS-15/14).
(RESERVED)

28. OCCUPATIONAL REQUIREMENTS. (See Figures 4-4 and 4-5.) These requirements focus primarily on specialized training and experience needed to perform the job. Certification authority is required at the GS-9 level and above. Employees entering the maintenance field will be required to satisfactorily complete all training required to perform their assignments. This required training can be considered as a career opportunity for the individual, as training becomes a means for developing skills and for advancing to jobs of higher responsibility. Other occupational requirements will include entrance medical examinations, security clearances, and standard vehicle operating licenses.
29. MAINTENANCE - INSTALLATION INTERFACE. (See Figure 3-3). Maintenance technicians may consider reassignments to installation in related specialty fields. Progressively responsible experience both in maintenance and installation provides the employee with a broad, diverse technical background. This becomes a career asset at the higher grade levels, especially for those employees seeking technical management positions. Interchange is most appropriate for technicians in the communications, nav aids, and radar specialty areas. Regions shall assure that this combination of experience within Airway Facilities is awarded appropriate credit in the selection criteria for first and second level supervisory positions by establishing weighted rating factors favoring both installation and maintenance experience.

FIGURE 4-1. ELECTRONICS MAINTENANCE TECHNICIANS: POSITION TITLES AND GRADES IDENTIFIED BY SECTOR TYPES.

GRADE	POSITION TITLE	LOCATION
GS-14	Chief, Sector Field Office	General NAS Sectors
GS-13	Assistant Sector Manager	
	Chief, Sector Field Office	↓
	Systems Performance Officer	ARTCC's
	Assistant Systems Engineer	
	Crew Supervisor	↓
	Proficiency Development & Evaluation Off.	ARTCC's & General NAS Sectors
	Unit Supervisor	Gen NAS Sectors
↓	Watch Supervisor	
GS-12	Proficiency Develop. & Evaluation Officer	
	Unit Supervisor	
	Technician-in-Depth (TID)	
	Relief Technician	
	Journeyman-Radar/Nav aids, Comm/Aids,	
	ARTS, Radar/Comm, Nav aids/Comm	
	Radar/Display, Data Processing, Comm,	↓
	Journeyman-Central Computer Complex,	ARTCC's
	Digital Computer Channel, Computer Display	
	Channel, Display, Comm, TID,	
↓	Systems Performance Specialist	↓
GS-11	Technician-in-Charge (TIC)	General NAS Sectors
	Journeyman-Central Computer Complex,	ARTCC's
	Digital Computer Channel, Computer	
	Display Channel, Digital Channel	
	Processor, Peripheral Devices, RBDE,	
	Comm, Systems Performance Spec.,	↓
	Journeyman ARTS, Radar/Comm,	General NAS Sectors
	Nav aids/Comm, Radar/Display	
	Data Processing, Comm/Aids,	
↓	Comm, Radar, Nav aids,	↓
GS-9	Relief Technician	Gen. NAS Sectors, ARTCC's
	Journeyman- Comm, Nav aids,	ARTCC's
	Periph Devices	↓
	Advance Trainee (Radar/Display)	Gen. NAS Sectors
	Comm/Aids, Radar/Comm, Nav aids,	
↓	Comm, Radar, Nav aids, Data Processing Gen.	↓
GS-4/7	Trainees/Developmental	All Sectors

NOTE: THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES WHICH NORMALLY CAN BE ATTAINED FOR EXISTING WORK AT A PARTICULAR TYPE OF FACILITY. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE OF THE BASIS OF DUTIES PERFORMED.

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FIGURE 4-2. ELECTRONICS MAINTENANCE TECHNICIANS:
CAREER PATTERNS TO THE JOURNEYMAN LEVEL.

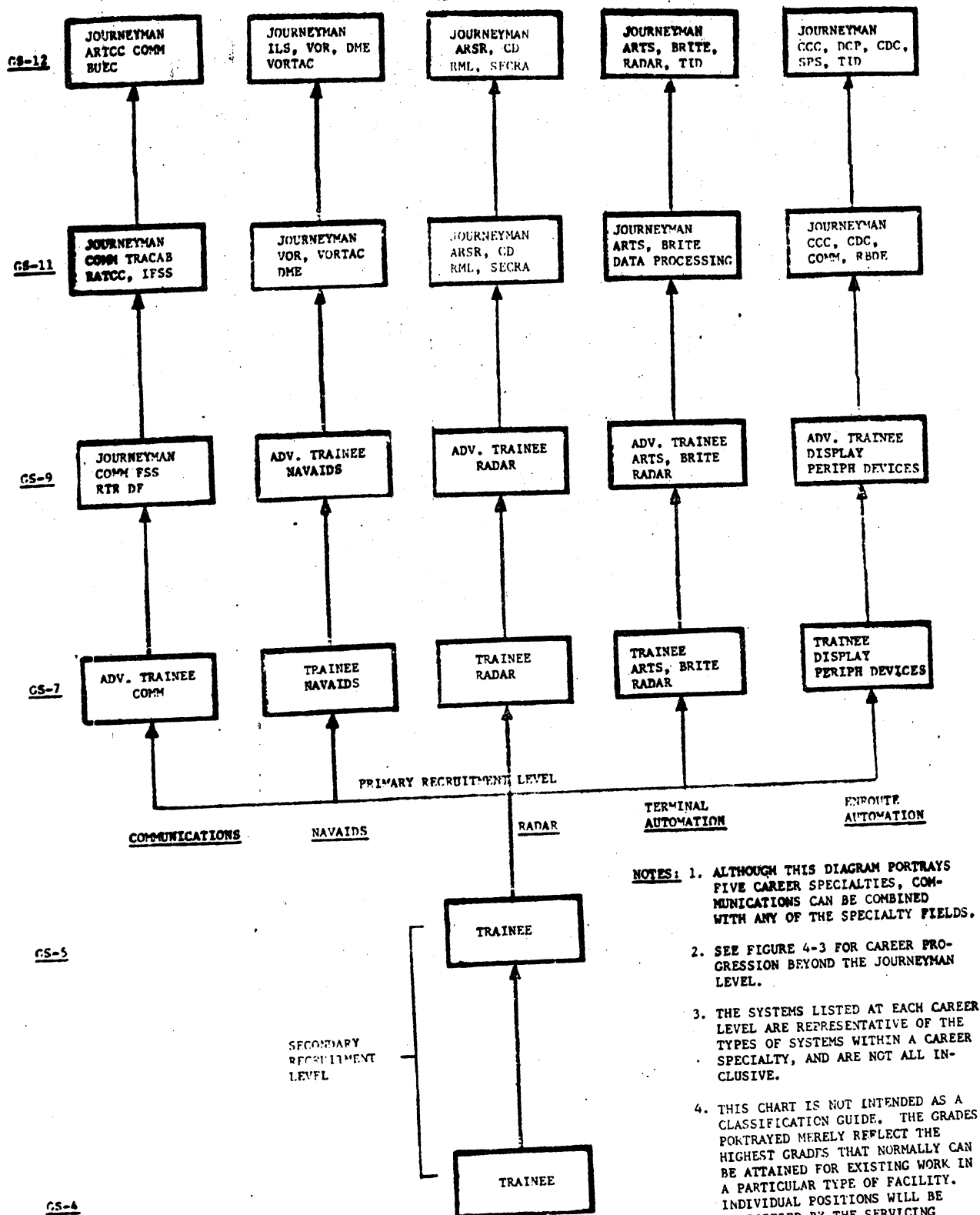
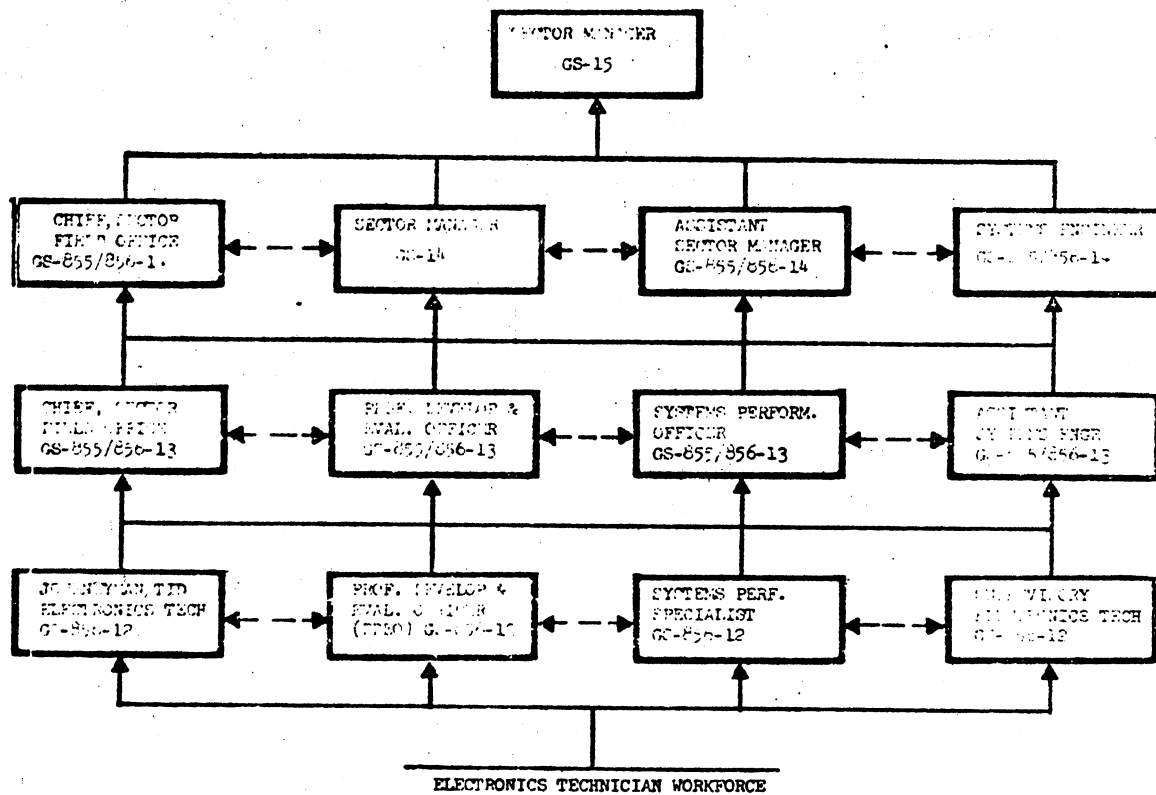


FIGURE 4-3. ELECTRONICS MAINTENANCE TECHNICIANS:
CAREER PATTERNS BEYOND THE JOURNEYMAN LEVEL.



- NOTES: 1. SOLID LINES DENOTE PROGRESSION.
2. DOTTED LINES INDICATE LATERAL ASSIGNMENTS TO ACQUIRE DIVERSITY OF EXPERIENCE.
3. THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES THAT NORMALLY CAN BE ATTAINED FOR EXISTING WORK IN A PARTICULAR TYPE OF FACILITY. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL ON THE BASIS OF DUTIES PERFORMED

FIGURE 4-4. ELECTRONICS MAINTENANCE TECHNICIANS: TRAINING PROGRESSION.

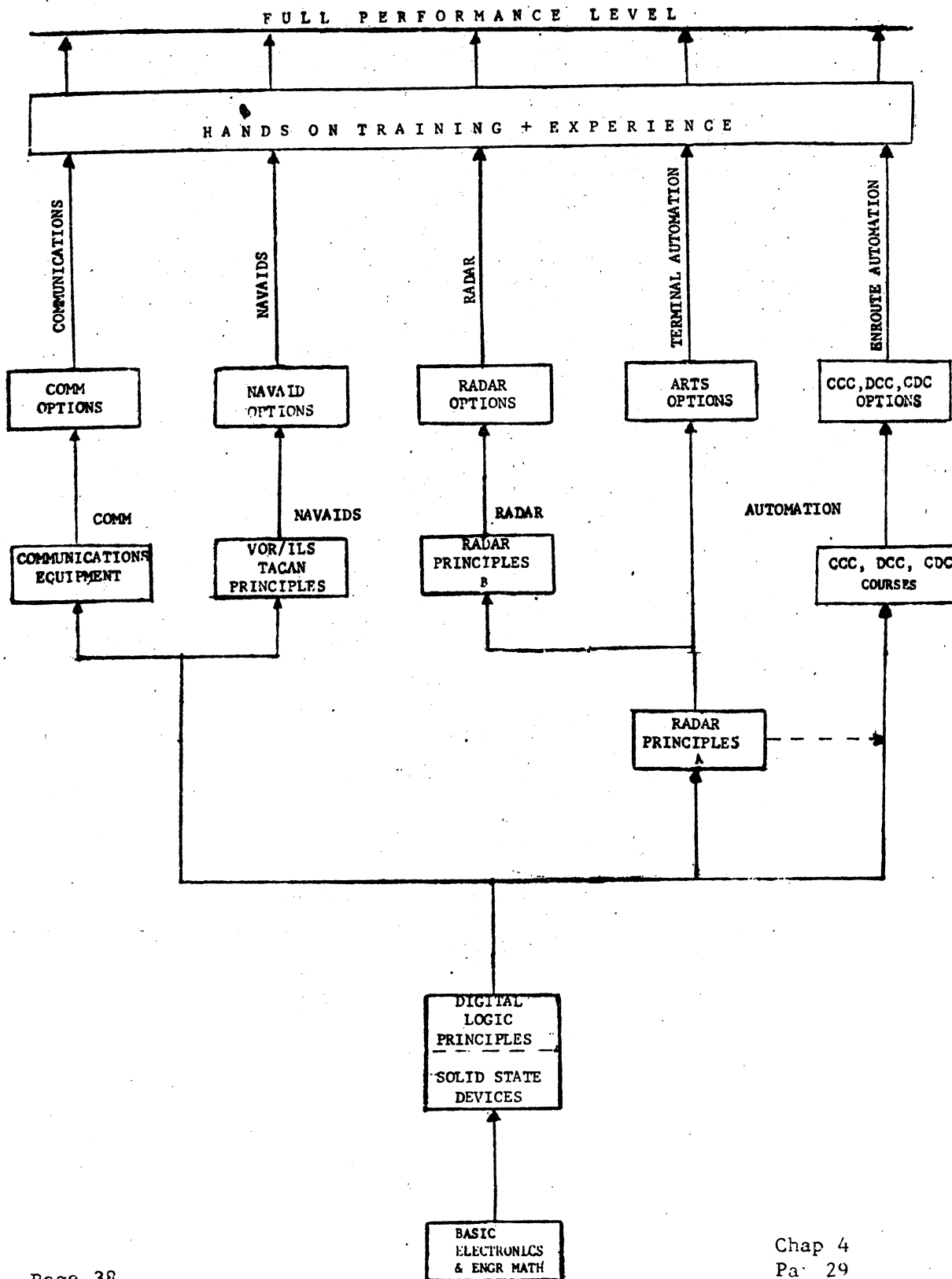


FIGURE 4-5 ELECTRONICS MAINTENANCE TECHNICIANS: OCCUPATIONAL REQUIREMENTS.

GRADE	EDUCATION	TRAINING	CERTIFICATION	MOBILITY	YEARS EXP.
GS-4	TS-97 Qual. Stnds High School Level Math, Electronics	None	None	Not Required	2 years 1½ gen. ½ spec.
GS-5	3 academic years post-high school study (tech.school, junior college, college) substitu- tion exper. allowed	Successful progress in AF training prescribed for GS-4			3 years technical exp; may be substi- tuted by education
GS-7		1/Attainment of knowledge and abilities in eight areas			1 year at GS-5
GS-9		Advanced principles course at FAA Academy; or equiva- lent certification	Certification authority for a number of subsystems or one system of lesser complex		1 year at GS-7
GS-11		Additional training as required	Certification authority for a number of subsystems or one system of higher complex		1 year at GS-9
GS-12			Certification authority for two or more complex systems 2/		1 year at GS-11
GS-13		Management training, Academy training, seminars as required.	Certification on one major system within purview of responsibi- lity	Not Required But Highly Desirable	1 year at GS-12
GS-14	Credit given for under-graduate work in engineering, math or physical sciences.				1 year at GS-13
<p>1/ Includes:</p> <ol style="list-style-type: none"> 1) Knowledge of basic and advanced electronic theory. 2) Ability to work with normal supervision. 3) Knowledge of basic and advanced mathematics. 4) Knowledge of basic and advanced physics. 5) Knowledge of transmitters and receivers. 6) Knowledge of theory, use and limitations of test equipment. 7) Knowledge of techniques of troubleshooting and circuit analysis. 8) Ability to use mechanical tools. <p>2/ Or certification authority for one large complex system, e.i., CCC,CDC,DCC,ARTS-III.</p>					

CHAPTER 5. PROFESSIONAL DEVELOPMENT PROGRAMS FOR AIRWAY FACILITIES TECHNICIANS

30. INTRODUCTION. The Airway Facilities organization has a continuing and increasing need for professional engineers. This chapter describes the avenues by which interested, highly qualified technicians can progress into these professional positions. Such progression offers broad career opportunities in the various engineering disciplines, and in many cases, serves as a stepping stone into management. The programs described in the following paragraphs are designed to complement, and not replace, the continuing recruitment of graduate engineers. For more specific information, see Civil Service Commission Handbook X-118.
31. CIVIL SERVICE COMMISSION ENGINEER QUALIFICATION REQUIREMENTS. There are numerous methods by which technicians can achieve qualification for professional engineering positions. Details concerning these career progression routes are described below to assist technicians in planning their self-development efforts. Also, refer to Figure 5-1 for a simplified version of qualification standards and requirements.
- a. Basic Requirements for all Professional Engineering Positions at all Grades: To qualify for all professional engineering positions, GS-5/15, a candidate must meet the basic requirements for all professional engineering positions. Technicians must show successful completion of a full four-year curriculum leading to a bachelor's degree, or higher, in engineering from an accredited college or university. To be acceptable, the curriculum must:
- (1) Be in a school of engineering with at least one field of study accredited by the Engineers' Council for Professional Development (ECPD) as a professional engineering curriculum, or
 - (2) Include differential and integral calculus and courses (more advanced than first-year physics and chemistry) in five of the following seven areas of engineering science or physics:
 - (a) Statics, dynamics;
 - (b) Strength of material (stress-strain relationships);
 - (c) Fluid mechanics, hydraulics;
 - (d) Thermodynamics;
 - (e) Electrical fields and circuits;
 - (f) Nature and properties of materials (relating particle and aggregate structure to properties); or
 - (g) Any other comparable area of fundamental engineering science or physics, such as optics, heat transfer, soil mechanics, or electronics.

- b. Alternate Requirement for Professional Engineering Positions At All Grades: It may be impossible for Airway Facilities personnel, because of cost, location, and/or work schedules, to complete a four-year engineering curriculum. The Civil Service Commission recognizes this and provides for an alternate requirement, through which candidates may substitute for the basic requirement at least four years of college-level education, training, and/or technical experience that furnishes:
- (1) A thorough knowledge of the physical and mathematical sciences underlying professional engineering; and
 - (2) A good understanding, both theoretical and practical, of the engineering science and techniques and their application to one of the branches of engineering. This knowledge and understanding must be equivalent to that provided by a full four-year professional engineering curriculum, as described in the basic requirement. The adequacy of such background must be demonstrated by one of the following:
 - (a) Professional Registration. Professional registration as an engineer can be achieved in any state, Guam, Puerto Rico, the District of Columbia, and the Canal Zone. Professional registration will meet Civil Service Commission criteria for qualifying in the GS-810, GS-830, GS-850, or GS-855 engineering series. Professional registration requires extensive evaluation of the employees' experience and educational record, and normally requires successful completion of the Principles and Practices (P&P) examination.
 - (b) Engineer-in-Training Examination. Evidence of having successfully passed the Engineer-in-Training Examination (EIT), or the written test required for professional registration, which is administered by the Boards of Engineering Examiners in the various states, Guam, Puerto Rico, the District of Columbia, and the Canal Zone will satisfy the CSC basic qualification requirements for engineering positions. The Fundamentals of Engineering Examination is composed of morning and afternoon sessions each of four-hours duration. The examination assesses competency in engineering subjects such as mathematics, nucleonics and wave phenomena, chemistry, statics, dynamics, mechanics of materials, fluid mechanics, thermodynamics, electrical theory, materials science, and economic analysis. The EIT examinations are given to candidates for professional engineering registration to determine if they meet the minimum requirements for registration established by state law.

- (c) Specified Academic Courses. Successful completion in an accredited college or university of a least 60-semester hours of courses in the physical, mathematical, and engineering sciences may constitute equivalency to the full four-year requirement, provided that the experience requirement is met. The curriculum for meeting the educational requirements is specified in the basic requirements. The courses must be fully acceptable toward meeting the requirements of a professional engineering curriculum as described in the basic requirements.
- (d) Related Curriculum. Successful completion in an accredited college of a full four-years or longer related curriculum leading to a bachelor's or higher degree in engineering technology or in an appropriate professional field, such as physics or architecture, may be accepted in lieu of a degree in engineering, provided the candidate has at least one year of professional engineering experience acquired under supervision and guidance of an engineer. Ordinarily, there should be either an established plan of intensive training to develop professional engineering competence, or several years of prior professional engineering experience.

32. POLICY AND PROCEDURES FOR INSERVICE PLACEMENT.

- a. Policy. For inservice placement actions, technician experience may be accepted as equivalent to the professional experience required for the same grade, when ALL of the following four conditions are met:
 - (1) The employee meets the basic qualification requirement of four years or more of education and/or experience specified for the professional engineering series, as demonstrated by one of the following:
 - (a) Satisfactory completion of the requirements for an appropriate bachelor's or higher degree is fully qualifying; or
 - (b) Satisfactory completion of 60-semester hours in engineering sciences; or
 - (c) Passing the written Engineer-in-Training (EIT) or the Principles and Practices (P&P) examination administered by state Boards of Engineering Examiners.
 - (2) The employee is being considered by reassignment from a technician position in grade GS-7, or above, to a similar professional position in the same specialty area at the same or a lower grade.

- (3) The technician experience, which is accepted in lieu of professional experience, is quasi-professional in character and is of the GS-7, or higher grade level.
 - (4) The duties, degree of responsibility, and subject matter of the professional and technician positions are sufficiently similar to demonstrate clearly that the employee has the necessary background to satisfactorily perform the duties of the professional position to be filled.
- b. Application Procedure. In order to apply for special inservice placement, technicians must submit proof that their experience is, in fact, professional. The following procedures must be followed:
- (1) Employees must prepare an updated SF-171, "Personal Qualifications Statement," along with all supplementary data necessary to substantiate their qualifications for professional status. Employees should indicate the grade level of professional engineering work for which technician experience is equivalent, and document the length of time in which their professional duties were performed.
 - (2) Employees will then submit their SF-171 and appropriate backup material through their immediate supervisors to the Personnel Management divisions with a cover letter requesting an evaluation of his or her qualifications for the professional engineering series.
 - (3) A supervisory statement should be submitted with the SF-171, which will validate as much of the engineering experience as possible. Supervisors must submit a statement verifying that the duties performed were essentially the same as those performed by a professional engineer, and certifying that the individual consistently applied mathematical, physical, and engineering sciences in solving theoretical and practical engineering problems. If, in the performance of duty, the employee did not consistently apply the above sciences, the supervisor should give the time (dates) that the technician did apply these sciences, and the approximate percentage of duties which required the application of these sciences.
 - (4) The Personnel Management division will determine if applicants meet minimum U.S. Civil Service Commission qualification requirements for entrance into the professional engineering series.

- (5) The Personnel Management division will establish a rating panel consisting of Airway Facilities engineers and technical personnel and one or more members from the Personnel Management division. The panel will evaluate the experience of the applicants and determine the appropriate engineering grade level for which they qualify.

33. PREPARING APPLICATIONS FOR STATE BOARD OF ENGINEERING EXAMINERS. Technicians applying for Engineer-in-Training (EIT) or Principles and Practices (P&P) examinations should take great care in preparing their applications. Each registration board deals with the educational and experience record of the applicant presented in a formal application and verified by the references provided. The evaluation process carried out by a board is thorough and exacting. While all board members are highly competent professional engineers, it must be recognized that because of the broad and diverse spectrum of applications, the board members may not be familiar with FAA educational and technical functions. Therefore, employees should go into considerable detail in explaining their work experiences and education.
 - a. Describing Education. Applicants should indicate if their educational program is accredited by the Engineering Council of Professional Development (ECPD). This constitutes a satisfactory educational background. All other educational sources should be described in detail, particularly in identifying the level of mathematics contained in engineering and scientific curricula. FAA Academy training and other professional training will be considered by the board. Catalog descriptions may not be completely satisfactory, so it is recommended that additional course descriptions be provided.
 - b. Describing Experience. State boards are autonomous and usually operate under the principle that "experience must be of a nature satisfactory to the board." Therefore, technicians should be very careful in preparing their experience description. Avoid documenting routine work even though it may be complex in nature. The board normally divides experience into two categories, which are:
 - (1) Semiprofessional engineering experience, which covers many facets of a technician's duties, and
 - (2) Professional engineering experience, which is allocated in "general professional," "responsible charge," and "design" components. General professional experience describes the how and what was accomplished in terms of applying math, physics and scientific techniques in resolving problems. Responsible charge defines successful accomplishment of engineering efforts independently, without receiving too frequent engineer-

ing advice and counsel. The responsibility must have been assigned solely to the individual. Design refers to independent evaluation and analysis in a test environment where innovative work was demonstrated. In addition, the following facts should be brought out in describing FAA experience:

- (a) A specific description of the function performed and over what period of time (decimal tenths of a year).
- (b) The sophistication and complexity of the problem, function or design.
- (c) The amount, level, breadth, and scope of education or training required.
- (d) Again, the degree and level of independence exercised.

34. PREPARING FORM SF-171 FOR FAA/CSC RATING PANELS.

- (a) Technicians applying for engineer positions in the FAA or in other agencies should take great care in preparing their SF-171 applications. For Civil Service Commission announcements, applications will require more detail in describing work experience than applications submitted to FAA rating panels. This is due to the unique technology and systems employed within the FAA which may be unfamiliar to engineers in other agencies. Therefore, Airway Facilities technicians need not elaborate on system descriptions when applying for inservice placement within the FAA.
- (b) Guide to Evaluating Airway Facilities Experience. There are several types of activities in which there is opportunity for technicians to perform engineering work. Review of these categories, which are listed below, should suggest to the applicant specific examples of qualifying professional experience.
 - (1) Design and redesign.
 - (2) Development of standards, techniques and procedures.
 - (3) Analysis of equipment or system design deficiencies.
 - (4) Evaluation of equipment design.
 - (5) Planning new installations, relocations, or additions to facilities.

- (6) Inspection of facilities.
 - (7) Planning or analyzing field engineering surveys.
 - (8) Instructor assignments at the FAA Academy.
35. ENGINEER-IN-TRAINING PREPARATORY COURSE. Regional Airway Facilities divisions and/or sectors may establish educational centers for conducting a formal Engineer-in-Training preparatory course.
- a. Locations of Centers. Educational centers will be established at locations where sufficient interest is shown.
 - b. Instructors. Instructors will be hired from the faculty of various accredited colleges and universities in the areas selected.
 - c. Length of Course. The course will be divided into four or five segments, with the total course length being approximately one year.
 - d. Class Sessions Class sessions will be established for either one 4-hour session, or two 2-hour sessions per week. In addition, one 3-hour group study session per week is recommended. Where possible, video tapes will be utilized to supplement instructions.
 - e. Cost of the Course. The student will be expected to bear the total cost for the course, including the cost of books and training material issued during the course. The total cost of a course will vary depending on the fees charged by professors.
 - f. Eligibility. The course is offered to technicians with strong backgrounds in mathematics, physics, and science. As a minimum, technicians should have successfully completed Course 44504, Electronics Fundamentals and Engineering Mathematics. In addition, they should be able to substantiate engineering experience to meet Civil Service Commission requirements (see Civil Service Commission Handbook X-118). It should be clearly understood that qualifying for engineer positions via the EIT examination method requires the equivalency of a four-year bachelor's degree in engineering. This equivalency is determined by evaluation of education, training, and experience. Successfully passing the EIT examination satisfies the major educational requirements for an engineer rating, but does not in itself satisfy all training requirements. In addition, appropriate engineering experience for each grade level must be satisfied.

g. Course Description. The course will cover fundamental engineering subject areas, which are:

- (1) Mathematics.
- (2) Nucleonics.
- (3) Chemistry.
- (4) Statics.
- (5) Dynamics.
- (6) Fluid Mechanics.
- (7) Thermodynamics.
- (8) Electrical Theory.
- (9) Materials Science.
- (10) Economic Analysis.

36. POSITIONS FOR ENGINEER EXPERIENCE. The following positions are recognized as the most appropriate positions for acquiring engineering experience.

a. Within the Sector:

- (1) Technician-in-Depth (TID) positions in which substantial engineering or quasi-engineering duties are performed.
- (2) Assistant System Engineer positions.
- (3) Environmental Support System Assistant Supervisory positions.
- (4) Proficiency Development and Evaluation Officer positions.
- (5) Systems Performance Officer positions.

b. Within the Regional Office :

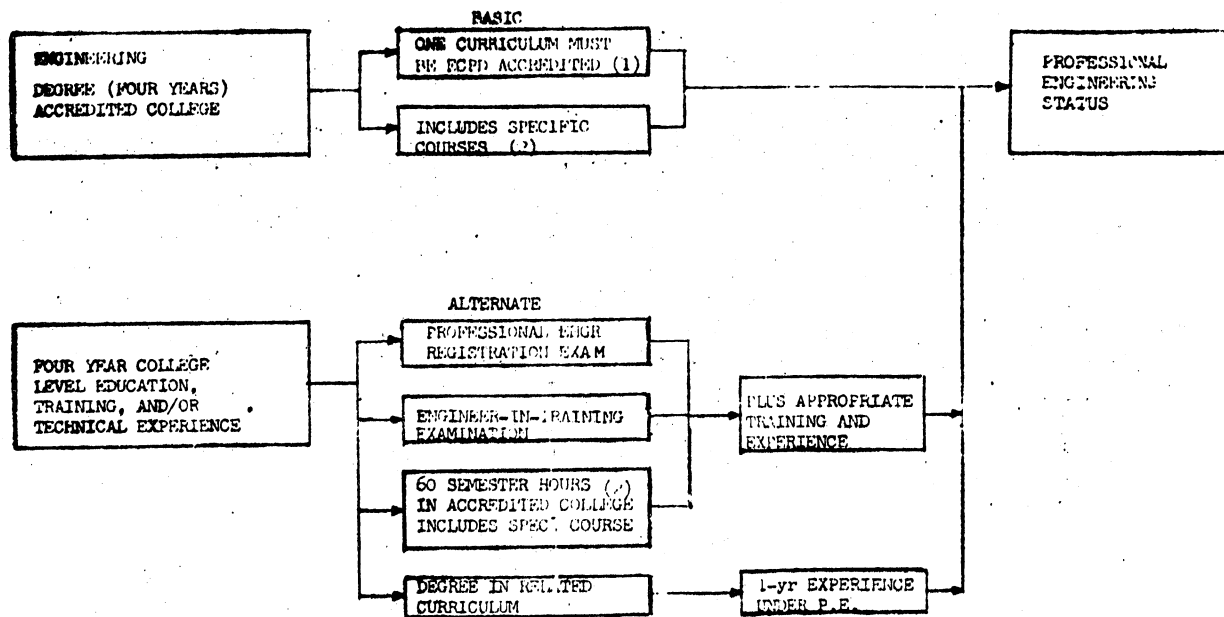
- (1) Journeyman and supervisory electronics installation technician positions (field installation assignments).
- (2) F&E or operations-funded positions which can be structured to require engineering or quasi-engineering work on a selected basis.

c. Related Organizations:

- (1) Aeronautical Center (instructor positions).
- (2) NAFEC (technician positions requiring quasi-engineering duties and responsibilities).

37. COOPERATIVE ENGINEER DEVELOPMENT PROGRAM (CEDP). A designated number of highly qualified technicians will be selected each year under a cooperative work and college program for development of engineering skills. Applicants must have completed two years in an accredited engineering, mathematics, or science curriculum, and be willing to accept reassignment within commuting distance to an engineering college or university. This is a two-year program in which the employee works and attends college on a 50-50 basis at full pay. In addition, the cost for books and tuition are reimbursable. Selections are made under the Merit Promotion Program, and employees are selected for target engineer positions. Final selection is contingent upon successful completion of the program. See Order 3410.10A, Cooperative Engineer Development Program, for complete details such as entrance requirements, application procedures, program requirements, expected outcomes, and additional information.
38. FEDERAL AVIATION AFTER-HOURS COLLEGE PROGRAM (FAACOP). Under this program, participating colleges and universities may grant up to 60 semester hours for FAA Academy training and combined work experiences. Participating institutions provide off-campus classroom instruction at FAA facilities, high schools and other off-campus locations. Cost of tuition and books must be borne by the employee. However, tuition rates are normally less than those charged for on-campus study. A variety of higher education programs and curricula are offered by the participating institutions. FAACOP has been expanded to include curricula leading to degrees in engineering at some of the participating institutions.

FIGURE 5-1. CIVIL SERVICE COMMISSION QUALIFICATION STANDARDS FOR ENGINEERING POSITIONS.



1. ENGINEERS COUNCIL FOR PROFESSIONAL DEVELOPMENT (ECPE)
2. CURRICULUM MUST INCLUDE DIFFERENTIAL AND INTEGRAL CALCULUS AND COURSES (MORE ADVANCED THAN FIRST YEAR PHYSICS AND CHEMISTRY) IN FIVE OF THE SEVEN FOLLOWING AREAS:
 - a. STATICS; DYNAMICS
 - b. STRENGTH OF MATERIALS
 - c. FLUID MECHANICS, HYDRAULICS
 - d. THERMODYNAMICS
 - e. ELECTRICAL FIELDS AND CIRCUITS
 - f. NATURE AND PROPERTIES OF MATERIALS
 - g. OTHER FUNDAMENTAL ENGINEERING SUBJECTS INCLUDING OPTICS, HEAT TRANSFER, ELECTRONICS

CHAPTER 6. CAREER SYSTEM FOR AIRWAY FACILITIES ENGINEERS

SECTION 1. GENERAL INFORMATION

39. INTRODUCTION. The Airway Facilities technical programs offer a wide range of career opportunities for engineers. The major engineering functions in Airway Facilities are concentrated in the fields of electronics, civil, electrical, and mechanical engineering. Each discipline offers diverse program functions and job specialties, geographic mobility, and challenging and rewarding technical assignments. Entry into Airway Facilities engineering positions is accomplished by selection of graduate engineers from Civil Service Commission (CSC) registers, transfer of engineers from other government agencies, and in-service placement of highly-qualified technicians who meet CSC qualification requirements for engineers. In addition, this order implements a comprehensive Engineer Intern Program designed to attract highly-qualified graduate engineers with a planned development program leading to full performance capability. Promotions for interns in the program will be on a noncompetitive basis to the GS-9 grade level provided all training and performance requirements are met. Progression to GS-11 full performance level positions for all engineers will be achieved through merit selection procedures. Progression to the GS-12 level and above, requires the demonstration of highly developed engineering skills and knowledge sufficient to satisfy correspondingly higher levels of responsibility. Technical assignments of increasing scope and challenge are available as engineers develop and move into positions of higher responsibility. Diversity of functional and organizational experience is encouraged for those individuals who seek supervisory and higher management positions. Additional technical training and management courses are provided as engineers advance toward their career goals.
40. ENGINEER INTERN PROGRAM. This program provides for the controlled selection, training, and development of college graduates in the specialized fields of engineering required by the Airway Facilities organization. An effective intern program will assure a continuous source of professional engineers in the civil, mechanical, electrical, and electronics career fields. Each region has the responsibility to establish and administer an effective engineer intern program.
- a. Selection and Coverage. Interns must meet basic engineering requirements described in the Civil Service Commission Handbook, X-118. Selections will be made competitively from appropriate lists of eligibles certified from Civil Service Commission registers. Interns will be recruited at GS-5 and GS-7 grade levels.

- b. Training and Proficiency Development. Each regional Airway Facilities division will provide a comprehensive engineer intern development program. The intern development period will be from 18-24 months depending upon entry grade, agency needs, and the progress of individual candidates. Training will be administered at the regional office and field facilities in both establishment and maintenance operations. Proficiency development will include directed study and resident FAA training, on-the-job training, and rotational assignments to other functional areas and Services. Rotational training assignments will vary in number and duration, depending upon prevailing circumstances and the development needs of the employee.
- c. Productive Work Assignments. Engineer interns will be expected to work on a productive basis. At least fifty percent of the developmental period will be spent on actual projects. Project assignments will become progressively more complex, and the engineer intern will be required to complete a major project during the last phase of the program. Interns will be assigned in both establishment and maintenance functional areas. The staff engineer position at sectors may be used for developmental assignments. The following distribution of functional assignments and training is recommended for intern development in three general areas:
- (1) Area I. Project engineering (F&E) assignments under supervision of experienced engineer. This assignment will include specified engineering duties on actual projects, formal FAA Academy and directed study training, and rotational assignments to other organizations (Airports, Air Traffic, Flight Standards, etc.) In addition, functional reassignments within Airway Facilities can be expected. Period of assignment - six months, maximum.
 - (2) Area II. Project installation assignments. The engineer will be assigned as a team member on actual field installation projects. During the final phase of this assignment, the engineer will be required to lead and complete a major installation project. Period of assignment - up to one year.
 - (3) Area III. Maintenance engineering assignment. The engineer will be assigned to specific maintenance projects within the regional office or a designated sector. The projects may include evaluation of sector engineering problems, facility and system inspection and analysis, site surveys, and/or problems related to installation, modernization, or modification projects. Period of assignment - six months, maximum.
- d. Promotional Opportunities. Promotions of engineer interns will be made on a noncompetitive basis up to the GS-11 level provided all training and work assignments are accomplished satisfactorily.

- e. Program Completion. After completing the intern program, engineers will receive specific career guidance and counseling. Engineers will then be assigned to full performance positions in either maintenance operations or establishment, depending upon program requirements.
41. RECRUITMENT OF EXPERIENCED ENGINEERS. Experienced engineers are recruited and selected from various sources including transfers from other government agencies, selection of candidates from Civil Service Commission registers and FAA Merit Promotion announcements, and from employees exercising Return, Reemployment, and Restoration rights. Engineers selected from the above sources are provided specialized training and developmental assignments as required.
42. CAREER OPPORTUNITIES. Airway Facilities engineers are offered many career opportunities in optional career specialties and program areas. Generally, engineers will develop their primary discipline, i.e., civil, mechanical, electrical, or electronics engineering either in the Maintenance Operations or in the Facilities and Equipment (Establishment) functional program areas. Engineers can advance from grade GS-5 to GS-14 in their chosen field. Advancement beyond the GS-14 grade level normally requires managerial capabilities and multifunctional experience in one or more engineering fields and program areas.
43. LOCATION OF ASSIGNMENTS. Airway Facilities engineers are selected for positions in the field organizations, regional offices, and Washington headquarters. Positions requiring similar skills and knowledge are also available at the Aeronautical Center in Oklahoma City, OK., the Systems Research and Development Service in Washington, D.C., and at the National Facilities and Experimental Center (NAFEC) in Atlantic City, N.J. (See Chapter 11.) Engineers in the F&E program area normally work in the regional offices and Washington headquarters. They may be detailed or temporarily assigned to field installations and projects. Project engineers at the GS-12 grade and below may be required to travel extensively in the performance of their assigned duties. In the Maintenance Operations program, engineers may be assigned positions in the sector field organizations, the regional office, or Washington headquarters. Although travel is more limited than for F&E counterparts, maintenance engineers can expect frequent travel while performing system evaluation and inspection, and in accomplishing special maintenance projects.
44. PROFESSIONAL DEVELOPMENT GUIDELINES FOR ENGINEERS. These guidelines apply to employees in all engineering fields within the Airway Facilities organization. Such guidance is provided to encourage professionalism within Airway Facilities and is not intended to set specific standards. Although development of professionalism is the individual engineer's prime responsibility, all managers within the Airway Facilities organization shall undertake to provide the proper atmosphere for this development, and shall encourage professionalism at all engineering levels.

- a. Continuing Education. All Airway Facilities engineers have continuous responsibility to maintain and further their individual technical competence and service to the public throughout their careers. Airway Facilities management, wherever possible, shall encourage the engineers to continue their education through agency programs, formal education programs at universities and colleges, and attendance at meetings and seminars on appropriate subjects. Agency assistance may include payment of all or part of the necessary tuition costs and expenses, as well as compensated leave for certain areas of professional study.
- b. Professional Societies. Engineers are encouraged to join and actively participate in professional societies. Such participation should include: attendance at society meetings, conferences, and conventions; service on committees; and the preparation of technical papers. Attendance at meetings and conventions may be supported with paid administrative leave and expenses in appropriate situations.
- c. Professional Registration. Engineers should actively pursue appropriate certification and registration as they become eligible. Airway Facilities management will provide guidance and assistance for obtaining certification as Engineers-in-Training and/or registration as professional engineers. Such assistance will include payment of approved expenses for refresher and other appropriate courses. (See Chapter 5 for details of professional registration procedures.) In addition, each organization shall encourage the display of professional licenses and the use of the PE suffix on all correspondence and directories which are not constrained by organizational practice.

NOTE: Whenever training or skill development is job related and produces a benefit for the agency, such training and development may be performed on-the-job at agency expense with the approval of the appropriate organizational office.

45. RESERVED.

SECTION 2. CAREER SYSTEM FOR ELECTRONICS ENGINEERS (GS-855)
AND GENERAL ENGINEERS (GS-801)

46. INTRODUCTION. Electronics and general engineers constitute over seventy-five percent of the total Airway Facilities engineering family. Electronics engineers have a diverse selection of career avenues within the Maintenance Operations and Facilities and Equipment program areas. The electronics-oriented systems within Airway Facilities offer career specialization in the areas of radar, nav aids, communications, and automation. These combinations of specialties within the two program areas offer many appealing options for electronics engineers. General engineering positions usually require mastery of a second discipline, although some job classifications are based on a variety of engineering functions where no single field is dominant. Because of the broadened career base required for general engineers, these positions are normally classified at the GS-11 grade, and above. Many technical manager positions are classified in the general engineer series.
47. ELECTRONICS ENGINEERS (GS-855).
- a. General Information. Electronics engineers are by far the largest single group of engineers in Airway Facilities. The continuing growth of opportunities in this field is due to advancing technology and the prolific expansion of automation. Larger engineering staffs are required by management to plan, evaluate, and implement complex technical programs.
 - b. Duties and Responsibilities. Engineers design, develop and write equipment and test specifications for new and modified electronics equipment and systems. They analyze and evaluate systems for design deficiencies in terms of operational and maintenance requirements; develop and revise equipment standards, and maintenance techniques and procedures; plan and conduct facility inspections and engineering surveys; and evaluate systems and facilities for conformity to standards and sound engineering practices. Engineers plan and program new installations, relocations, and additions to facilities; perform site surveys and prepare sites for project implementation; analyze and evaluate new system designs including the preparation and review of contract specifications and proposals. They monitor, supervise, and accept complete electronic installations and assure that all portions of the integrated systems operate and perform according to established standards and for the service intended.

48. GENERAL ENGINEERS (GS-801).

- a. General Information. General engineers are the second largest engineering group within Airway Facilities, and this field is rapidly increasing to keep pace with multisystem integration and expanding engineering skill requirements. Classification in this series offers opportunities in all engineering disciplines utilized by Airway Facilities. The career system has been combined with that of electronics engineers because of the similarity of progression lines, especially in the maintenance functional area. This does not imply that electronics engineers have easier career access to the general engineer field.
- b. Duties and Responsibilities. Position requirements for general engineers are very similar to other engineering disciplines. Normally, these positions cover a wide range of technical subjects and functional areas, and may encompass duties and responsibilities in two or more fields; e.g., electronic and environmental engineering. The Environmental Support System (ESS) supervisory position (GS-801-12) is an example of a general engineering position in maintenance operations. Engineers in these positions supervise technical personnel in the maintenance of complex power conditioning systems (PCS), diesel and gasoline engine-generators, air-conditioning and heating systems, power distribution and grounding systems, and facility maintenance (buildings, towers, grounds, roads, etc.). These positions effectively embrace all engineering disciplines (civil, electrical, mechanical, and electronics) utilized by Airway Facilities. In other positions, general engineers perform multifunctional duties in environmental and electronics, frequency management, manpower and training, and maintenance and establishment program management.

49. CAREER PROGRESSION FOR ELECTRONICS AND GENERAL ENGINEERS. A wide selection of career opportunities are available for both electronics and general engineers in the maintenance and establishment program areas.a. Electronics Engineers.

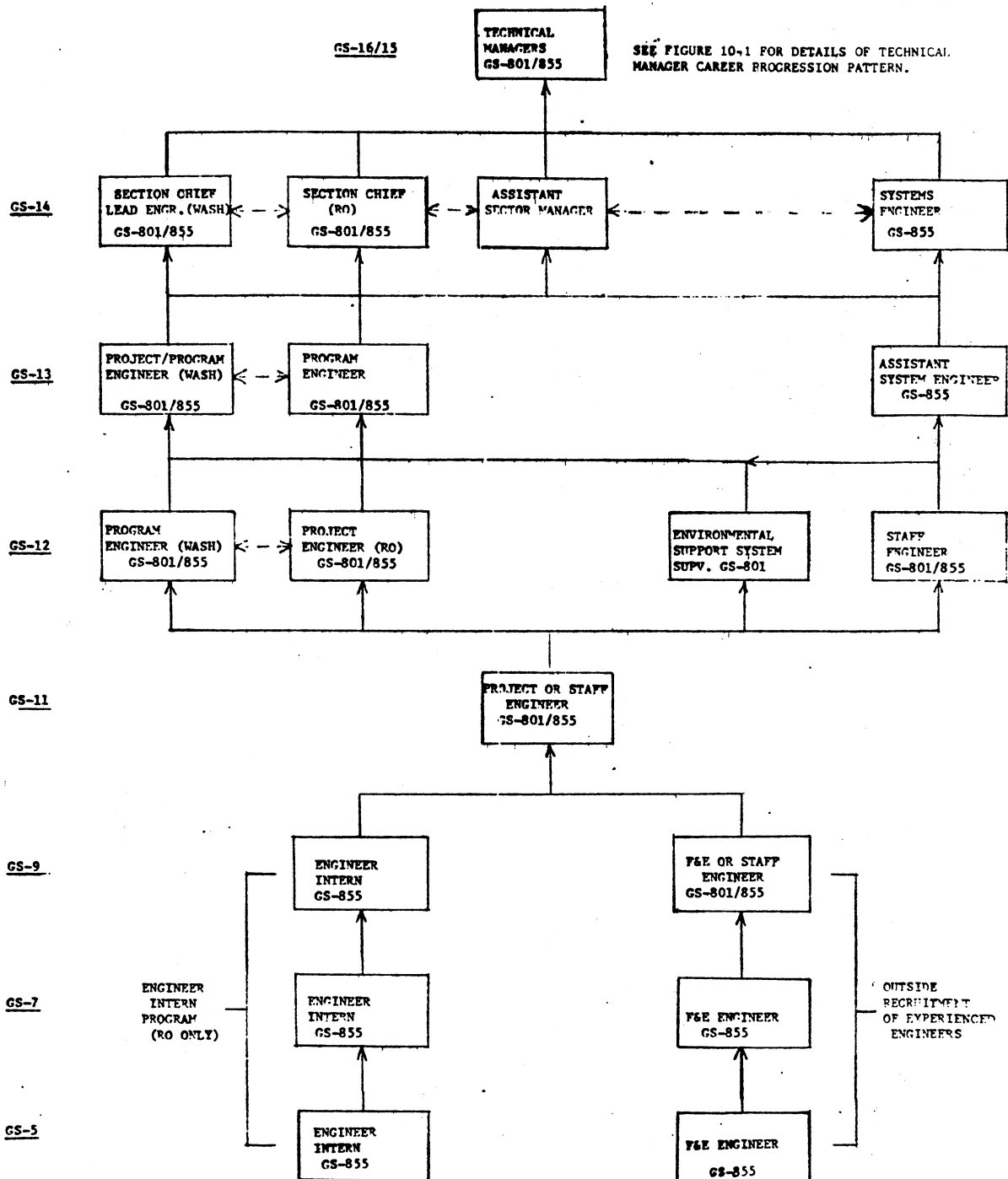
- (1) Progression in Establishment. (See Figure 6-1.) Normally, entry grades for engineers range from GS-5 through GS-9, depending upon previous training and experience. These junior engineers will be assigned to establishment projects throughout their employing region. They will receive progressively more responsible assignments as they develop and demonstrate their engineering abilities. They will be trained in, and assigned to the specialty fields of communications, nav aids, radar, and automation. They assist full performance level engineers on moderately complex areas of F&E projects. At GS-11 grade level,

they will be required to perform full project engineering duties and provide technical advice, coordination, and supervision on independent electronic systems and projects. They are encouraged to broaden their career base in adjacent engineering fields at the GS-12 grade, and above. Lateral and promotional assignments are available in the Maintenance Operations area. At the GS-12 and GS-13 grade levels, engineers must be technical experts within their area of responsibility. Positions are located in the regional office and Washington headquarters. Progression continues to the GS-14 level at both locations. At this level, engineers normally are supervisors, project or program engineers, staff officers, or program managers. Other offices and services at Washington headquarters, NAFEC, and the Aeronautical Center have similar positions with functions and responsibilities at the same grade levels (see Chapter 11).

- (2) Progression in Maintenance. Maintenance engineers may be assigned to AF sectors as staff engineers at grades GS-5 through GS-12. Figure 6-1 shows this position at the GS-9, GS-11, and GS-12 levels in a typical line of progression. Staff engineers will require extensive system training to prepare for more responsible jobs within the sector. The normal progression line for staff engineers will be to the Assistant Systems Engineer or Assistant Sector Manager positions at the GS-13 grade level. From the GS-13 level, engineers can advance to Systems Engineer and Assistant Sector Manager or Sector Manager at the GS-14 grade level. Optional career paths are available for engineers in the regional office and Washington headquarters, generally at the GS-12 grade level and above. Functional mobility can be achieved in the engineering and facilities and equipment (F&E) branches in the regional office and Washington headquarters, and by crossing service lines to the Systems Research and Development Service, NAFEC, the Aeronautical Center, and other organizations. (See Chapter 11.)
- b. General Engineers. (See Figure 6-1 and 6-2.) General engineers have excellent career progression opportunities in Airway Facilities. The grade levels in this field range from GS-11 to GS-18. Due to the requirement for multidiscipline skills and knowledge, most general engineer positions are found in technical management positions at the higher grade levels (GS-14 through GS-16). For the same reason, there are few general engineer positions established below the GS-11 grade level. Staff engineer positions, however, have been authorized in the sectors to perform multidiscipline functions at the lower grade levels. As a consequence, a pipeline for qualified general engineers is being developed. General engineers can progress either within the sector or to the regional office and Washington headquarters. Additional opportunities are available in the Systems Research and Development Service, NAFEC, the Aeronautical Center and in other Offices and Services at Washington headquarters. Technical management

positions are available at the GS-15 and GS-16 grades within the various FAA organizations (see Chapters 10 and 11).

FIGURE 6-1. ELECTRONICS ENGINEERS (GS-855) AND GENERAL ENGINEERS (GS-801):
CAREER PATTERNS.



SECTION 3. CAREER SYSTEM FOR CIVIL ENGINEERS (GS-810), MECHANICAL ENGINEERS (GS-830), ELECTRICAL ENGINEERS (GS-850), AND GENERAL ENGINEERS (GS-801)

50. INTRODUCTION. Civil, mechanical, and electrical engineers are the other major engineering groups employed by Airway Facilities. Engineers in these groups perform vital functions required to accomplish facility construction, installation, expansion, and systems maintenance engineering. These engineers complement the electronics and general engineers, primarily in the facilities and equipment (F&E) functional area. Career lines of progression are comparable to the electronics and general engineering fields, although optional avenues for progression are somewhat restrictive to the F&E program. However, positions are available at Washington headquarters in the Maintenance Program and Environmental Engineering divisions for civil, mechanical, and electrical engineers. Engineers in these disciplines are encouraged to expand their knowledge and skills in the maintenance program and in adjacent engineering fields, especially in the electronics field where there are more progression lines available to sector manager and other technical manager positions.
51. CIVIL ENGINEERS (GS-810).
- a. General Information. Civil engineers are employed in all regions and at Washington headquarters, with career opportunities extending across service lines in the Airports Service, the Systems Research and Development Service, and NAFEC. The civil engineering function continues to increase with the national expansion and modernization of facilities. Job opportunities and upward mobility are extremely good to the GS-13 grade level.
 - b. Duties and Responsibilities. This work force is responsible for construction activities including engineering design; specification development and review; technical review of contracts and evaluation of bids; supervision and accountability of project activity; and inspection and final acceptance of construction work. Civil engineers analyze, redesign, modify, and evaluate engineering requirements, implementation plans and procedures, standards and specifications, and other design criteria related to construction of buildings, roads, towers, and facilities. In addition, they maintain accurate geographical information including U.S. geological maps, land surveys, soil and terrain studies, and other related information. They are responsible for the preparation of environmental impact statements. Civil engineers resolve most complex problems, which may be encountered during all phases of construction activities, and engineering maintenance. They participate in final acceptance and commissioning of all buildings, facilities, and projects for which they are assigned.

52. MECHANICAL ENGINEERS (GS-830).

- a. General Information. Mechanical engineers are employed in all regions and at Washington headquarters, with career opportunities extending across service lines in the Systems Research and Development Service, and at NAFEC. Optional avenues of progression are somewhat restricted to the facilities and equipment (F&E) program, and in special design areas. Upward mobility however, is extremely good to the GS-13 grade level within the career field.
- b. Duties and Responsibilities. Mechanical engineers are responsible for all project planning and programming, implementation and testing activities, and in the maintenance of the mechanical equipment and systems required to sustain the National Airspace System (NAS). Mechanical engineers work closely with electrical and civil engineers in establishing and modernizing facilities, structures, conveyances, and complete environmental systems. Many of their engineering duties relate to establishment projects. They prepare, evaluate, and review contract specifications, proposals of work, and all technical contents of bids and awards. They evaluate and analyze new and existing equipment for deficiencies. Such equipment includes elevator systems, air-conditioning, heating and ventilating systems, and diesel and gasoline engines. Mechanical engineers develop and revise maintenance standards and procedures for mechanical and electromechanical systems. In addition, they design and modify special-use systems such as personnel conveyances for mountaintop facilities, window-washing equipment for tower cabs, and ventilating and filtering systems for desert facilities.

53. ELECTRICAL ENGINEERS (GS-850).

- a. General Information. Electrical engineers are employed in all regions and at Washington headquarters, with career opportunities extending across service lines in the Systems Research and Development Service and NAFEC. Electrical engineers have essentially the same career development pattern as civil and mechanical engineers. Upward mobility is comparable with all other engineering fields up to the GS-13 grade level. The electrical engineering field in Airway Facilities has a high growth potential based on the agency's continuing demand for more sophisticated and more reliable environmental support systems.
- b. Duties and Responsibilities. Electrical engineers are responsible for planning, procuring, implementing, and maintaining complex electrical and environmental systems related to power plants and power distribution equipment and systems. They design, modify, and develop elaborate electrical and power conditioning systems, as well as ancillary control, monitor, and switchgear subsystems.

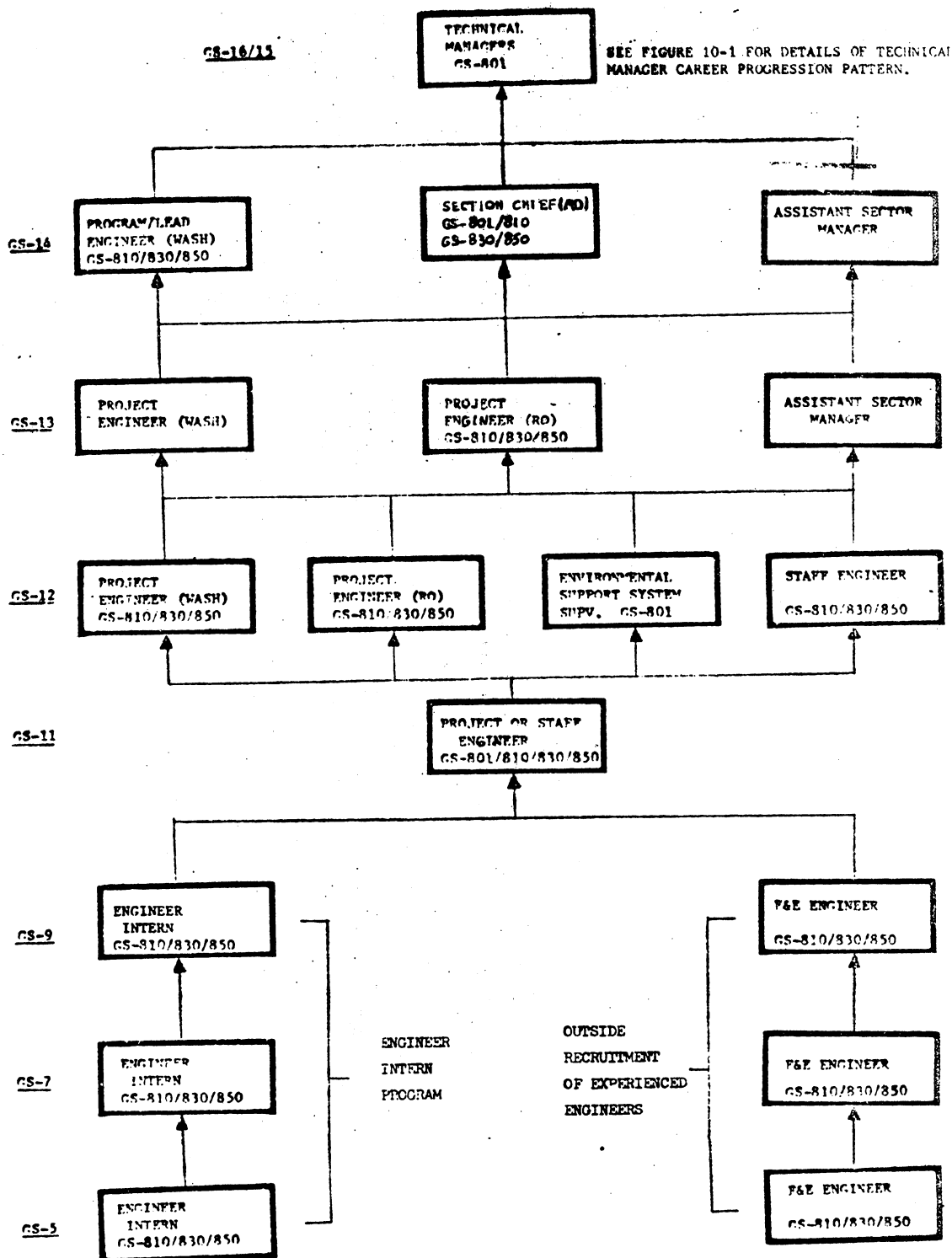
In addition, they perform engineering analysis on power distribution equipment and facility grounding systems. Electrical engineers prepare, review, and revise contract specifications; review, evaluate, and approve technical content of contract proposals and bids; develop and revise system standards and operating tolerances of new and existing electrical equipment and systems; evaluate and analyze new equipment and systems for design deficiencies and maintainability; and prepare cost analysis and complete engineering feasibility studies on proposed systems. In addition, they act as technical advisors on large installation projects, and they may be assigned to a facility as a resident engineer to assist in installation and site management activities. Concurrent with these duties, they participate in final acceptance and commissioning of all electrical systems and facilities.

54. CAREER PROGRESSION FOR CIVIL, MECHANICAL, AND ELECTRICAL ENGINEERS. (See Figure 6-2). Junior engineers have a career ladder from GS-5 to GS-9; and they can progress either through the Engineer Intern Program, or through a parallel developmental ladder. At the GS-11 level, engineers are assigned duties and responsibilities at the full performance level. They normally assist higher-grade engineers by completing task assignments requiring depth of analysis in specialized areas of engineering. Early in their career development, engineers may also apply for sector staff engineer positions at grades GS-5 through GS-11. Staff engineers can progress to Environmental Support System supervisory positions. Progression beyond this point requires the engineer to relocate to the regional office or Washington headquarters. At the GS-12 level, engineers are assigned independent project responsibility on highly complex systems. Progression to the GS-13 and GS-14 grade levels require the abilities to lead complex projects and program assignments and by progressively demonstrating higher engineering knowledges and skills. Diversity of experience will enable engineers in these positions to progress to Assistant Sector Manager and Sector Manager positions. Engineers in these disciplines normally progress to general engineer (GS-801) positions at the GS-14 and GS-15 grade levels.

4/7/76

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FIGURE 6-2. CIVIL ENGINEERS (GS-810), MECHANICAL ENGINEERS (GS-830) AND ELECTRICAL ENGINEERS (GS-850): CAREER PATTERNS.



NOTE: THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES WHICH NORMALLY CAN BE ATTAINED FOR EXISTING WORK AT A PARTICULAR TYPE OF FACILITY. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE OF THE BASIS OF DUTIES PERFORMED.

CHAPTER 7. CAREER SYSTEM FOR ENGINEERING SUPPORT PERSONNEL

SECTION 1. COMPUTER SYSTEMS ANALYSTS (GS-334)

55. GENERAL CHARACTERISTICS. This highly-skilled group of Airway Facilities employees performs the continuous analyses, design, programming, and redesign of computer software systems. These software systems contain dynamic operational programs, system support software, system documentation, engineering changes, logistics programs, and a multitude of maintenance diagnostic programs. Some of the more important duties and functions performed by systems analysts are:
- a. Analyzing operational and maintenance requirements in terms of system design and functional specifications.
 - b. Developing and testing authorized computer modifications for field use.
 - c. Determining impact of software and hardware modifications on existing system design, operational requirements, and maintenance capability.
 - d. Providing software support to field facilities in the identification and solution of specific problems.
 - e. Establishing and developing national technical standards and procedures for all NAS programs.
 - f. Participating, with computer and systems engineers and program managers within and outside the government, to assure that NAS software systems, techniques, and procedures are current, efficient, and superior in quality.
56. CAREER GOALS AND OPPORTUNITIES. Computer systems analysts can progress to the GS-14 grade level within the Airway Facilities Service at Washington headquarters. Additional career opportunities are available for computer systems analysts at NAFEC and with other offices and services at Washington headquarters.
57. CAREER PROGRESSION. Entry into this career field is normally at the GS-9 and GS-11 grade levels. (See Figure 7-1.) Depending upon the employee's background, recruitment at Washington headquarters may be at grades GS-11 and GS-12. Systems performance specialists, NAFEC programmers, and highly-qualified computer operators are among the sources of recruitment for this career field. Career progression in this field will depend upon the employee's initiative to learn job skills and to apply sophisticated programming techniques. Analysts must become highly knowledgeable in hardware design, systems specifications, and operational parameters. Software applications are directly

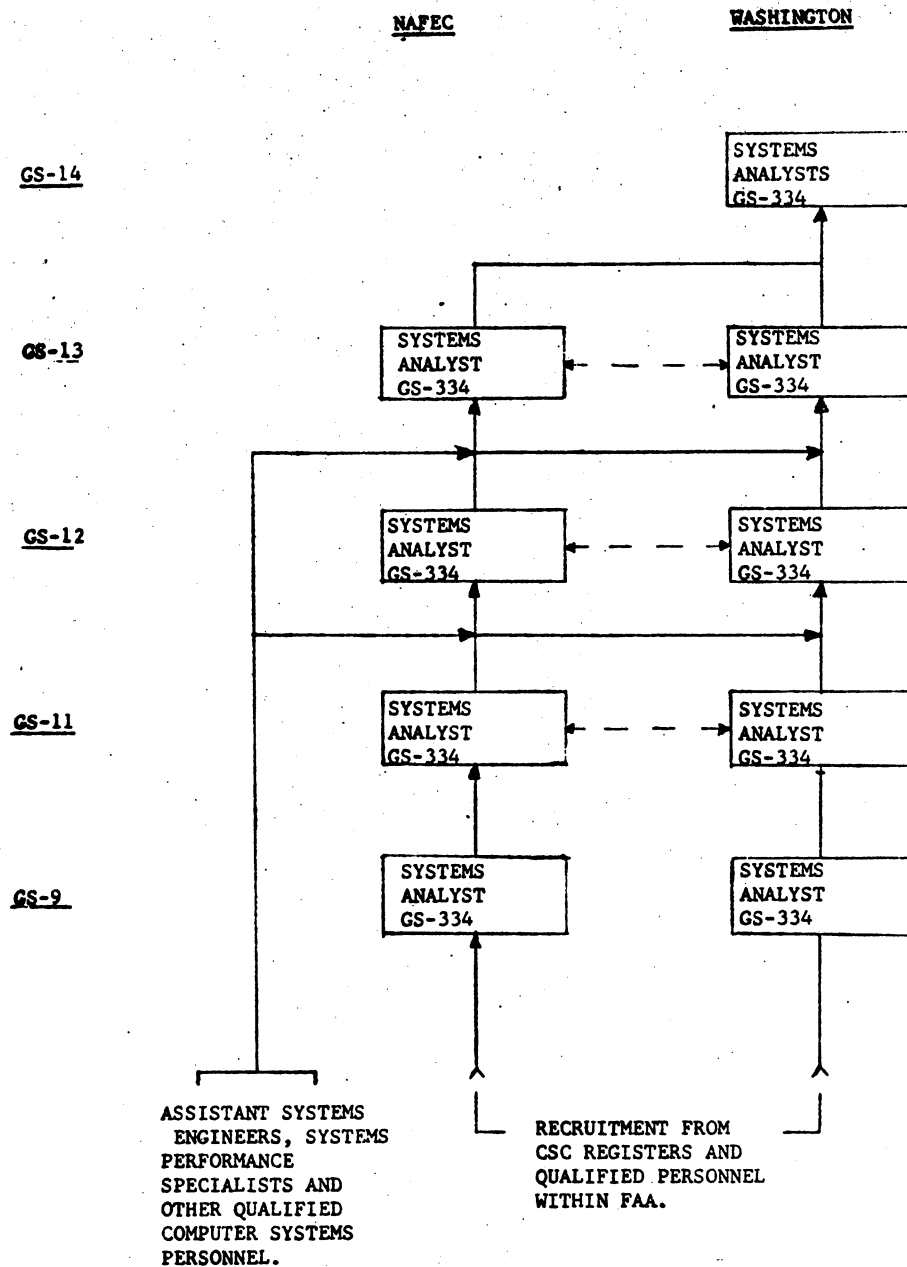
related to the hardware design constraints. The rate of progression will depend upon the employee's ability to combine the skills, knowledge, and abilities both in hardware and software applications. Systems analysts may progress to the nonsupervisory GS-14 grade level at Washington headquarters. On-the-job training may be augmented by FAA Academy courses in systems analysis and programming, and through out-of-agency training assignments.

58. OCCUPATIONAL REQUIREMENTS. This group of employees normally work in offices and computer centers. Systems analysts are required to travel to NAFEC, the regions, and to various centers to accomplish their assignments in the automation program. Requirements for entrance medical exams and security clearances are standard.

4/7/76

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FIGURE 7-1. COMPUTER SYSTEMS ANALYSTS (GS-334): CAREER PATTERNS



NOTE: THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES THAT NORMALLY CAN BE ATTAINED FOR EXISTING WORK IN A PARTICULAR TYPE OF FACILITY. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL ON THE BASIS OF DUTIES PERFORMED

SECTION 2. CIVIL ENGINEERING TECHNICIANS AND CONSTRUCTION REPRESENTATIVES

59. GENERAL CHARACTERISTICS. Employees in these occupations perform essential engineering support activities in both design and construction, which culminates in building occupancy and commissioning of facilities. In addition, they assist engineers in redesign and modification to existing structures, devices, and systems.

a. Civil Engineering Technicians (GS-802). Employees in this group assist civil engineers and perform assignments requiring a high degree of technical and analytical judgment. Engineering technicians perform a variety of duties in the construction, installation, relocation, and modification of facilities and structures. They assist the civil engineers in site planning and preparation and complete studies involving cost of materials and labor, soil composition, and other environmental factors. They also review contract specifications and proposals, and provide recommendations to engineers based on their knowledge and experience with similar designs and constraints. Civil engineering technicians are given a wide latitude of assignments, and they may be assigned to independently lead specific projects where engineering design and precedent have been established.

b. Construction Representative (GS-809). These employees perform a variety of duties pertaining to the construction, installation, and modification of structures for nav aids and air traffic control facilities. They inspect, monitor, and control work progress as a resident representative at the project site. Construction representatives must possess and demonstrate:

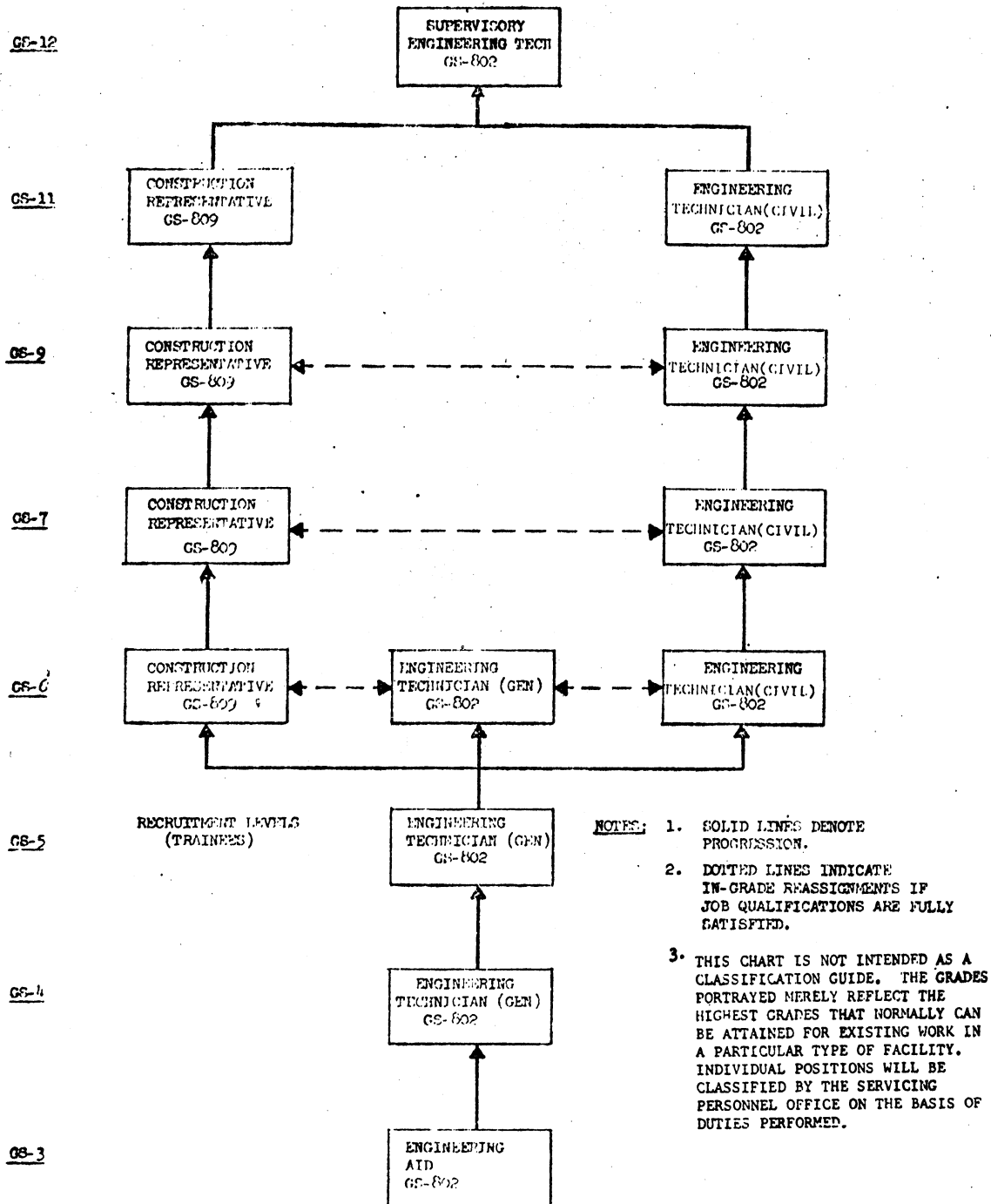
- (1) Practical knowledge of engineering methods and techniques.
- (2) Knowledge of construction practices, methods, techniques, and costs of material and equipment.
- (3) Ability to read and interpret engineering and architectural plans and specifications.

60. CAREER GOALS AND OPPORTUNITIES. Career opportunities are considered good for employees in these career fields. Progression into the engineering series, however, is dependent upon self-development and achievement of qualification requirements for engineers as discussed in Chapter 5.

a. Civil engineering technicians can realistically achieve the GS-11 grade level. There are a limited number of GS-12 positions in instances where several technicians form a permanent unit within an F&E organization.

- b. Construction representatives can progress from Inspector Aid, GS-809-3, positions to the GS-11 grade in their career field. Virtually all positions are located in the regions, with assignments to field project sites.
61. CAREER PROGRESSION. (See Figure 7-2.) Progression for employees in these occupational fields covers a range from GS-3 to GS-12. The close progression relationship between these two occupational fields allows a single career progression description. Employees normally are recruited at the GS-3 through GS-5 grade levels. The GS-3 grade is an "aid-to" position, and employees at this level are assigned tasks that are performed under close supervision. Progression to GS-4 and GS-5 affirms that employees can perform more difficult tasks under moderate supervision as they become familiar with plans, specifications, schedules, and work processes. They will work as team members performing specific studies and tasks. Promotion to GS-6 and GS-7 grades depends upon demonstrated ability to interpret guidelines, make independent analyses, and complete major project assignments. Full performance level work is expected at the GS-7 level and above. Progression to GS-8, GS-9, and GS-10 grades reflects a high degree of knowledge and skills in the respective fields. Construction representatives may be assigned to independently monitor and inspect moderate-to-large projects at these grade levels. Engineering technicians are assigned comparable degrees of responsibility and will be assigned evaluation tasks on medium-to-large construction or installation projects. The GS-11 grade level affirms the highest degree of skills. Where engineering design and procedures have been established, employees at this grade level may be assigned complete implementation responsibility on moderately-complex projects. A limited number of GS-12 supervisory grades are available.
62. OCCUPATIONAL REQUIREMENTS. Occupational requirements vary in each of the fields. However, such requirements as passing entrance medical exams and possessing security clearances are common to both. Construction representatives and civil engineering technicians will be required to have a valid vehicle operator's license and will be expected to travel frequently. Employees in these two occupational groups are required to work inside and outside.

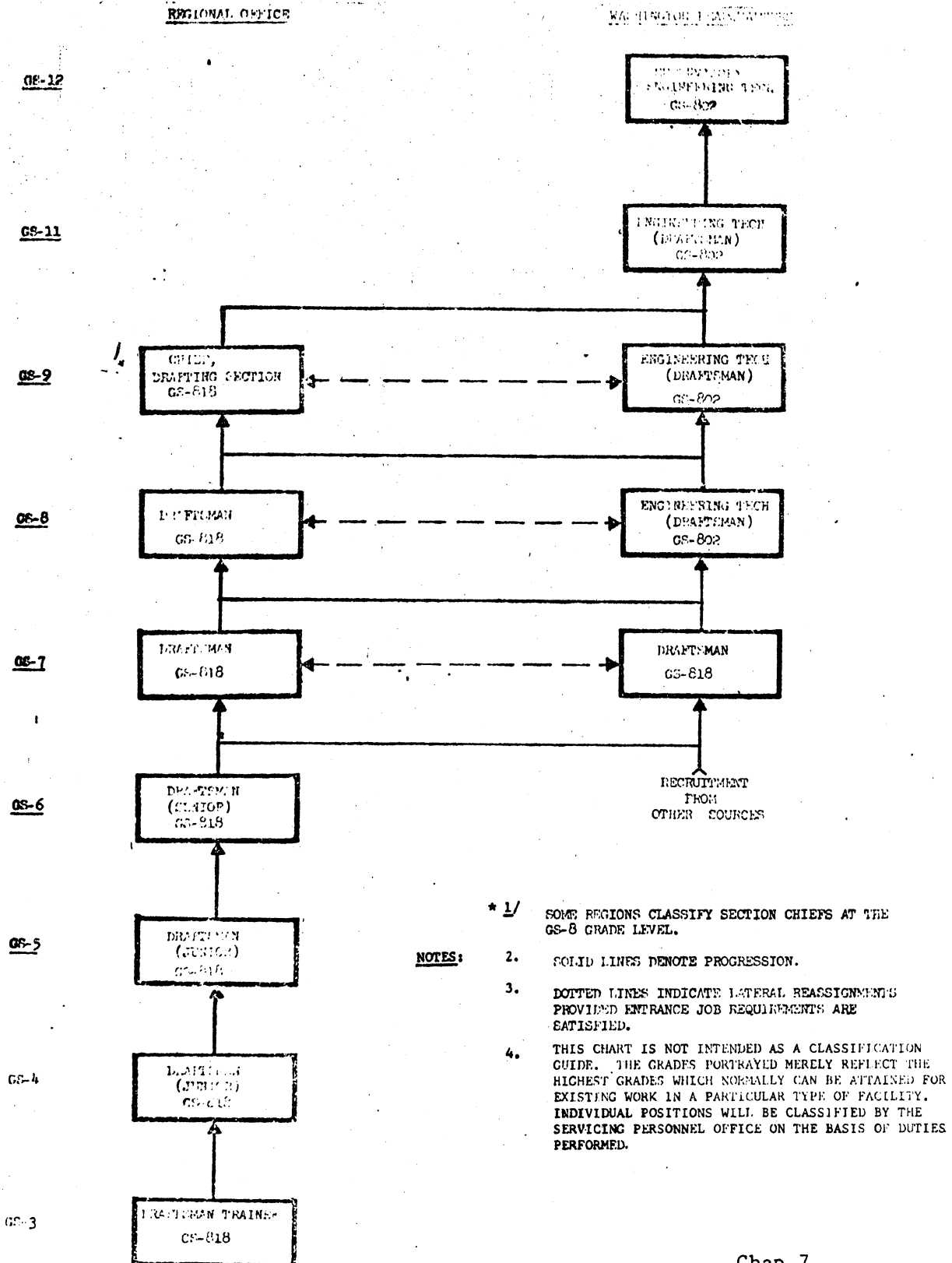
FIGURE 7-2. CIVIL ENGINEERING TECHNICIANS (GS-802)
AND CONSTRUCTION REPRESENTATIVES (GS-809):
CAREER PATTERNS



SECTION 3. ENGINEERING DRAFTSMEN (GS-818)

63. GENERAL CHARACTERISTICS. Employees in this occupational field must possess essential and exacting skills, which are required to describe, communicate, and carry out engineering ideas, design, and processes. Such work culminates in a useful end product, i.e. complete drawings for buildings, facilities, systems, and devices. These employees utilize highly specialized skills to portray engineering designs in the form of drawings, blueprints, diagrams and schematics. Their work effectively communicates the ideas of engineers and technicians through symbols, lines, shadings, and legends. Draftsmen are primarily responsible for selecting the best projections, views, scales, labels, dimensions, and shadings (crosshatching) for portraying the design and by applying skill in the use of drafting techniques and methods for actually preparing the drawings. Draftsmen are involved in work progressing from routine copying to the most difficult projection and shading techniques to depict complete designs of complex systems and facilities.
64. CAREER GOALS AND OPPORTUNITIES. Draftsmen can progress from GS-3 to GS-7 at the regional offices, and supervisory grades extend to GS-8 and GS-9 grade levels. Career opportunities are also available for a limited number of positions at Washington headquarters. Employees must transition to the engineering technician series (GS-802) to advance above the GS-8 level at headquarters. Since they work closely with the engineering disciplines, this work association could provide a stimulus for career growth through engineer education, and eventually engineer status. (See Chapter 5.)
65. CAREER PROGRESSION. (See Figure 7-3.) Employees normally are recruited at the GS-3 and GS-4 grades. Draftsmen at these grades make minor changes to drawings, use copying machines, maintain blueprint files, perform lettering, and complete drafting work under close supervision. Promotion to the GS-5 and GS-6 grade levels affirms a moderate-to-high degree of independence, and the ability to form complete layouts and projections, including shading and crosshatching with appropriate symbology and notation. Employees progressing to the GS-7 grade level must have demonstrated superior skill in all phases of drafting, and must be capable of using sketches, catalogs, and technical references in interpretive skill processes. Supervisory positions are available at grades GS-8 and GS-9 in regional offices. Employees at Washington headquarters can progress to the GS-11 grade level by qualifying for the GS-802 series. This classification imposes higher levels of responsibility and requires the ability to initiate design without precedent and by interpreting requirements from engineers.
66. OCCUPATIONAL REQUIREMENTS. Draftsmen are required to work in an office environment either at the regional office or Washington headquarters. They are required to pass an entrance medical examination and be granted a security clearance. Occasionally, draftsmen may receive field assignments to complete building, facility, or systems drawings (as-builts) on large complex projects.

FIGURE 7-3. ENGINEERING DRAFTSMEN (GS-818): CAREER PATTERNS



4/7/76

CHAPTER 8. CAREER SYSTEM FOR FIELD SUPPORT OCCUPATIONS

SECTION 1. COMPUTER OPERATORS (GS-352)

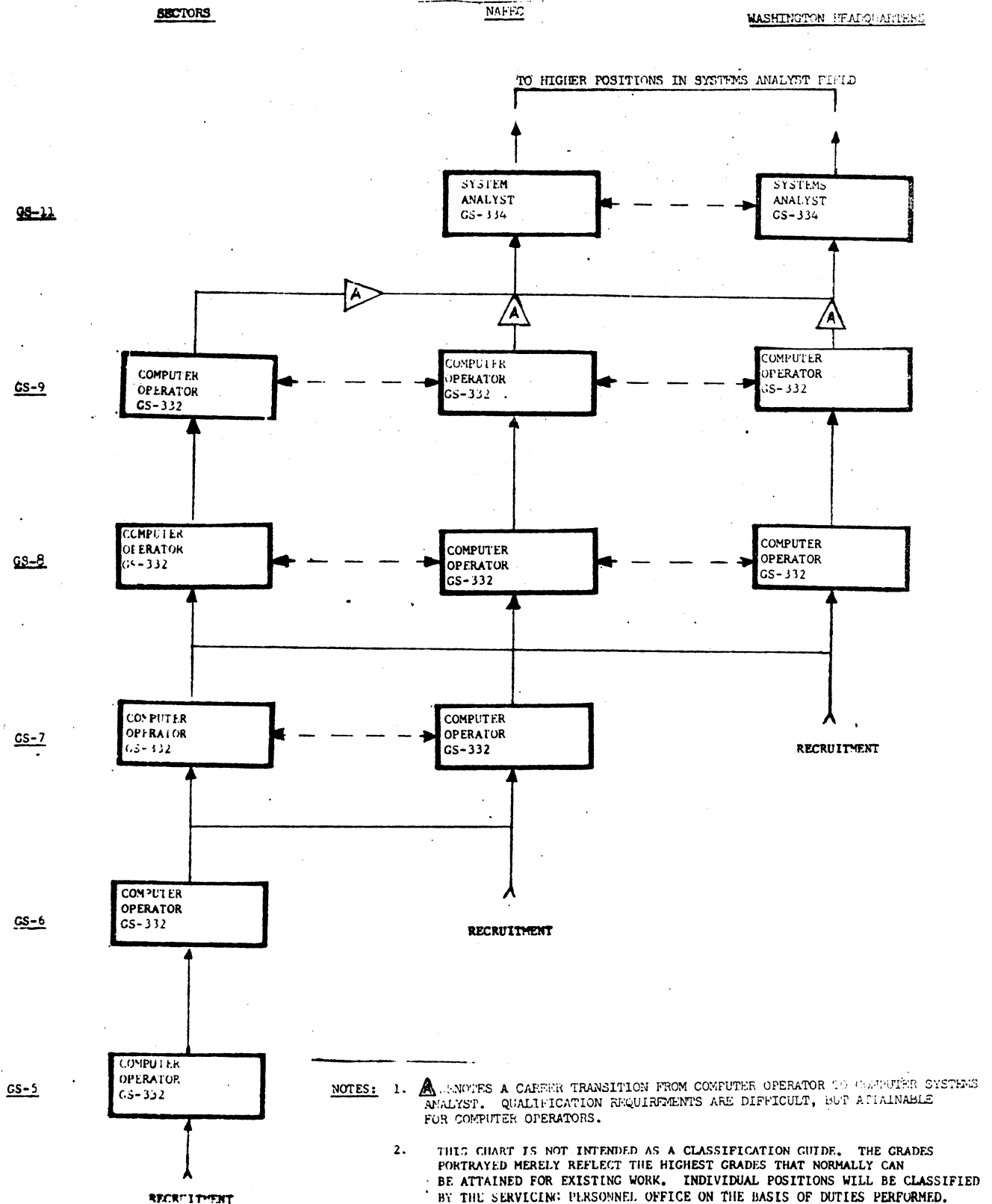
67. GENERAL CHARACTERISTICS. Employees in this group are assigned to ARTCC's, major airport terminals, and telecommunications centers in Airway Facilities. They are primarily responsible for the efficient utilization of central computer complexes. This responsibility is carried out by:
- a. Preparing input data from source information through punched cards, card-readers, and keyboards.
 - b. Loading and unloading programs from magnetic tape, disks, and card decks.
 - c. Scheduling user requests and performing the queuing necessary to exercise as many computer elements as possible without causing user delays.
 - d. Initiating program execution and restarts following interrupts of the system.
 - e. Controlling and coordinating the computer operations according to system priorities, storage allocation, system configuration, and user demand.
 - f. Assuring that console position and monitor/control centers are continuously in order and available for operational and maintenance use.
 - g. Maintaining the software documentation system.
 - h. Monitoring output devices and stations within the central computer complex, which includes the monitoring of error messages and system interrupts.
68. CAREER GOALS AND OPPORTUNITIES. Computer operators in Airway Facilities presently can achieve the GS-9 grade level in the ARTCC sector organization. Positions at this level also are available at NAFEC and Washington headquarters. Because of the highly technical and specialized applications of computer programs in Airway Facilities systems, it is extremely difficult to bridge the gap between computer operator and computer systems analyst. Systems analyst positions normally are filled by electronics technicians and engineers with extensive training and experience in both hardware and software applications. However, computer operators who commit themselves to individual development programs can transition to computer programmer/systems analyst positions at NAFEC and Washington headquarters.

69. CAREER PROGRESSION. Progression for computer operators extends from grade GS-5 to GS-9 within Airway Facilities. Employees are recruited at the GS-5 and GS-6 grades, depending upon previous training and experience (see Figure 8-1.) The primary source of candidates are from private industry where similar central processors, control consoles and input/output devices are utilized. Progression to the GS-6, GS-7, GS-8, and GS-9 grade levels is competitive, and is dependent upon how rapidly employees develop and increase their proficiency in operating and controlling large central computer complexes used in dynamic air traffic control systems and processes.
70. OCCUPATIONAL REQUIREMENTS. Occupational requirements include the standard requirements for entrance medical examinations and security clearances. Employees are also required to complete on-the-job training and FAA Academy courses, which may be assigned. Computer operators normally work rotating shifts at major computer complexes.

4/7/76

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FIGURE 8-1. COMPUTER OPERATORS (GS-332): CAREER PATTERNS



SECTION 2. FIELD LOGISTICS PERSONNEL (GS-2001 & GS-2005)

71. GENERAL CHARACTERISTICS. Field logistics specialists and supply clerks provide the essential services of logistics support for all operating facilities, equipment, and systems. Field logistics personnel are assigned to most Airway Facilities sectors in the National Airspace System (NAS). This segment of the work force contributes an extremely vital function to the continuing operation and service of the integrated NAS system.
- a. Work Environment. The field logistic personnel in Airway Facilities are assigned to ARTCC's, most general NAS sectors, and to some of the larger sector field offices (SFO's). They usually work in environmentally controlled office buildings; however, all assignments require some outside work and activities. Duties away from the office include trips to purchase supplies and special-purpose items, travel to distribute material to peripheral sector units and to ship and receive material at post offices, and railway, bus, and air freight terminals. Logistics personnel are required to receive, monitor, inventory, and inspect goods delivered to the facilities by shipping companies and contractors. In some cases, they supervise and control the unloading, unpacking, and physical placement of such material and equipment.
- b. Nature of Work. Field logistics personnel perform a variety of tasks in fulfilling their assigned responsibilities.
- (1) Supply Clerks (GS-2005). These employees maintain property accountability and inventory control records; receive, post, and process requisitions; perform receiving and shipping activities, which includes the preparation of shipping lists and bills of lading, the inspection and inventory of goods, and the documentation of these activities; maintain general administrative supplies, reorder, and make small purchases as required; and perform general clerical duties, prepare correspondence, and assist higher grade supply clerks and field logistics specialists in performing the major functions of the field logistics office.
- (2) Field Logistics Specialists (GS-2001). These employees perform a variety of duties in managing and directing the major functions of the field logistics office. They review, plan, and program the sector's logistics requirements; plan, determine, and recommend budgetary requirements for the logistics function and control the disbursement of sector programmed funds allocated for the logistics function; and maintain the full property accountability including inventory control and disposal of

surplus, unserviceable, and nonrepairable real property. In addition, field logistics specialists perform contractual services and lease negotiations and monitor performance of service contractors; assure adequate identification and storage of stock supplies; control the redistribution of equipment, spares and supplies; monitor and control sector use of local purchase authority; develop and prescribe logistics technical standards; conduct sector logistics evaluations; review and implement sector accomplishments of new or revised logistics procedures and practices; and assure that logistics training is accomplished among the many duties of supervising one or more subordinates.

72. CAREER GOALS AND OPPORTUNITIES. Airway Facilities logistics personnel can pursue career progression opportunities up to the GS-8 grade level in many sector organizations. Career opportunities are expanded beyond this level only if employees cross organizational lines into the regional offices/centers logistics divisions, or into the Logistics Service at Washington headquarters. Realistic career goals extend to the GS-13 grade level in the regional offices/centers and to the GS-14 grade level at Washington headquarters. At both locations, employees generally specialize in functional jobs of higher responsibility.
73. CAREER PROGRESSION. (See Figure 8-2.) Career progression for field logistics personnel in Airway Facilities is limited to the GS-4 through GS-8 grade range. The Logistics Service has the primary responsibility for developing career progression for field logistics personnel beyond the top of the career ladder available in Airway Facilities. Logistics Service will develop and sustain a career interface for Airway Facilities logistics personnel. See Order 3500.2, Field Logistics Specialist Program.
 - a. Progression Within Airway Facilities. The field logistics career field generally begins at the GS-4 grade level.
 - (1) Recruitment Sources. The source of candidates for these entry positions as a supply clerk are:
 - (a) Promotion or reassignment of Airway Facilities employees from the administrative career field.
 - (b) Transfers or reassignments from other FAA organizations.
 - (c) Transfers from other government agencies or appointments from Civil Service Commission registers.

4/7/76

- (2) Progression continues for the supply clerks to the GS-5, and GS-6 grade levels. Employees will receive extensive on-the-job training and may be assigned seminar or orientation training at the regional office. Progression to the GS-7 grade level requires the employee to qualify and be selected for the Field Logistics Specialist position (GS-2001). Progression continues to the GS-8 grade level in some sectors provided the employee meets all training and experience qualifications and is selected for positions under merit promotion procedures. Specialized training is required for field logistics specialists. This training includes the following courses:

- (a) Field Logistics Management Course.
- (b) Provisioning, Cataloging and Standardization Course.
- (c) FAA Inventory Management Course.
- (d) Fundamentals in Procurement and Contracting Course.

- (3) Self-Development. Field logistics employees may also prepare themselves for other career fields such as engineering technicians, electronics technician, or computer operators by pursuing self-development educational program (see Chapter 1, paragraph 6. Recommended areas of study are:

- (a) Electro-mechanics;
- (b) Electrical and electronics fundamentals;
- (c) Business law;
- (d) Computer technology;
- (e) Accounting;
- (f) Marketing;
- (g) Procurement; and
- (h) Business administration.

b. Progression to Positions at the Regional Office and Centers. Progression realistically extends to the GS-11 grade level at these locations. Supervisory grades are available at the GS-12 grade level, and above. Employees may require additional training to qualify for some positions. Information pertaining to requirements at the various grade levels can be obtained from the servicing Personnel Management divisions. The following are some of the positions available at the regional offices and centers with the grade range normally attainable:

- (1) Contract and Procurement Specialist (GS-1102-7/11).
- (2) Property Disposal Specialist (GS-1104-7/11).
- (3) Purchasing Agent (GS-1105-5/7).
- (4) Public Utilities Specialist (GS-1130-9/11).
- (5) Production Specialist (GS-1152-5/11).
- (6) Real Estate Specialist (GS-1170-7/11).
- (7) General Supply Specialist (GS-2001-5/11).
- (8) Supply Program Manager (GS-2003-7/11).
- (9) Inventory Manager (GS-2010-7/11).

c. Progression to Positions at Washington Headquarters. The Logistics Service in Washington offers positions similar to those listed above. Opportunities for advancement extend to the GS-14 grade level in the General Business and Industry Series (GS-1101); Contract and Procurement Series (GS-1102); Industrial Specialist Series (GS-1150); Real Estate Series (GS-1170); General Supply Series (GS-2001); and General Management (GS-301). These higher positions are highly specialized, with additional responsibilities at each successive level.

74. OCCUPATIONAL REQUIREMENTS. Working conditions for field logistics employees are varied and stimulating. A significant amount of time is required to perform office duties pertinent to the overall supply and accountability functions. At other times, employees will be required to pack and unpack boxes, load and unload equipment and material, and perform other required physical tasks. Entrance medical examinations, security clearances, and a valid vehicle operating license are among the job requirements. Although not a mandatory requirement, employees in this field should be technically-oriented, and they should develop their technical abilities to the extent of correlating written description of parts, components, assemblies, and devices to the actual physical objects of that description.

SECTION 3. FIELD MAINTENANCE PARTIES

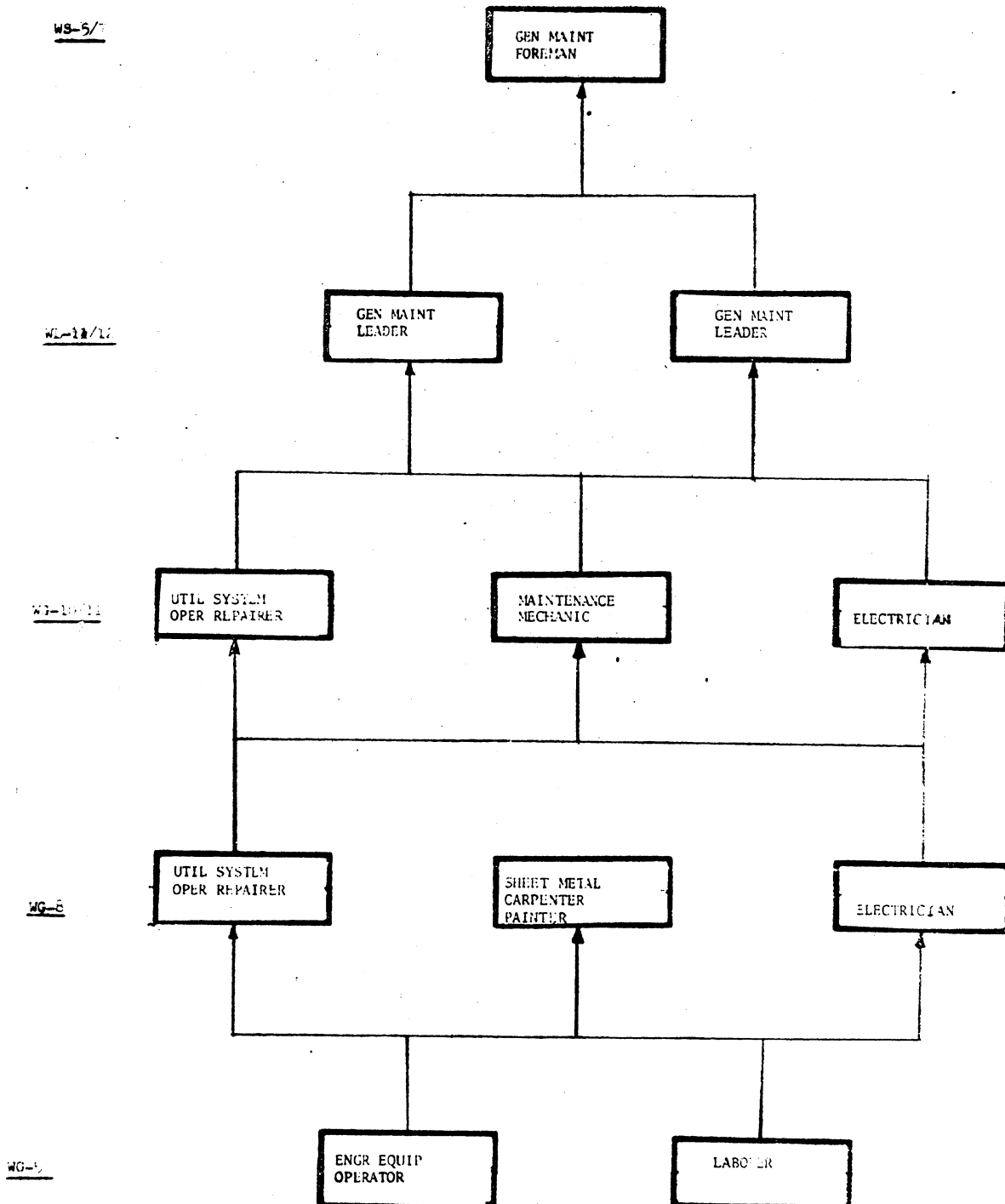
75. GENERAL CHARACTERISTICS. Field Maintenance Party employees form a unique and vital segment of the Airway Facilities work force. They are responsible for maintaining, repairing, and restoring facilities, building, towers, roads, and grounds. They perform various other inside and outside tasks, generally described as heavy-duty work assignments.
- a. Field Maintenance Party Functions.
- (1) Inside and outside painting of buildings and towers.
 - (2) Road grading, resurfacing, and general road repair.
 - (3) Tower positioning, alignment and repair, including retensioning of guy wires and assuring safety of ladders, platforms, and guardrails.
 - (4) Repair and refurbishment of engine generators and electrical and grounding systems.
 - (5) Rehabilitation of cables, overhead supports, access holes, cable splices, connectors, and terminations.
 - (6) Carpentry, sheet metal fabrication, roofing repair, etc.
 - (7) Maintenance and repair of heating and air conditioning equipment.
 - (8) Maintenance and repair of water and sewage systems, including septic tanks, treatment plants and drain fields.
 - (9) Operation and maintenance of heavy-duty and special-purpose vehicles, such as graders, snow-plows, etc.
 - (10) Emergency facility restoration duties following natural disasters, fires, etc.
- b. Field Maintenance Party Occupations and Skill Composition. Field Maintenance Party (FMP) personnel are predominately Wage Grade employees with some supervisory positions classified in the engineering and electronics technician General Schedule series. Unit supervisors are usually maintenance leaders and general maintenance foremen depending upon the size and nature of the project, and the degree of responsibility charged. Some occupational trades and skills utilized in Field Maintenance Parties are painters, carpenters, maintenance mechanics, engineering equipment operators, electricians, power support systems mechanics, and laborers.

76. CAREER GOALS AND OPPORTUNITIES. The future outlook for employees in this field has brightened considerably over the past few years. Although personnel are highly specialized in their crafts and trades, they have the opportunity to cross-train, to some extent, within their team's area of assignment. In addition, the higher skilled employees have an excellent chance for selection in the environmental support systems career field (see Chapter 2).
77. CAREER PROGRESSION. (See Figure 8-3.) Entry grades are determined by previous training and experience, and most FMP members are recruited at the WG-8 level. Progression to WG-9 and WG-10 are realistic career goals, provided employees develop their skills and improve their job performance. There are a limited number of WG-11 and higher grade positions in jobs structured with a high degree of responsibility and with minimum supervision. Employees are encouraged to accept all training offered by the agency. Employees in trades such as maintenance mechanic, electrician, engine generator repairer, and equipment operator are encouraged to qualify themselves for higher level Wage Grade positions in the Environmental Support Systems field (see Chapter 2).
78. OCCUPATIONAL REQUIREMENTS. Working conditions in this field are the most strenuous within Airway Facilities. Therefore, employees should be in excellent health. Employees perform many of their assignments outside under varying climatic conditions. In addition, assignments usually cover a wide geographic area requiring considerable travel. Many work sites are in remote areas ranging from deserts to mountain tops. Climbing towers and lifting moderately heavy objects are required in certain assignments. Employees are generally required to be licensed drivers and must pass entrance medical examinations and possess security clearances.

4/7/76

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FIGURE 8-3. FIELD MAINTENANCE PARTIES (FMP): CAREER PATTERNS



NOTE: THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES WHICH NORMALLY CAN BE ATTAINED FOR EXISTING WORK AT A PARTICULAR TYPE OF FACILITY. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE OF THE BASIS OF DUTIES PERFORMED.

CHAPTER 9. CAREER SYSTEM FOR ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS

79. GENERAL CHARACTERISTICS. This vital segment of the Airway Facilities work force covers several occupational groups which comprise the administrative and managerial support career system. Persons in these groups perform essential duties and services throughout the Airway Facilities organization.

a. Major Occupational Groups.

- (1) Secretaries (GS-318), Clerk-Stenographers (GS-312), Clerk Typists (GS-322) are employed within all Airway Facilities organizational elements. They are responsible for performing administrative functions required by their organizational element. They control and prepare correspondence and maintain files, records, and documentation. Their efficiency and applied administrative skills are directly related to the overall efficiency and responsiveness of the organization.
- (2) Administrative Assistants (GS-301) and Administrative Officers (GS-341) normally work in the regional office or Washington headquarters. They perform general and specialized administrative duties and functions. Generally, they control the directives, records, and correspondence of large organizational units, i.e., branch or division level. They may also be assigned specialized duties such as maintaining training files or technical libraries, updating charts or frequency listings, processing employee suggestions, etc.
- (3) Fiscal Clerks (GS-501) and Budget Analysts (GS-560) are employed in the regional office and Washington headquarters. They are responsible for controlling program funds and developing budget estimates for the maintenance operations and F&E programs.
- (4) Management Analysts (GS-343), Management Technicians (GS-344) and Program Analysts (GS-345) work at the regional office and Washington headquarters. They are responsible for accomplishing managerial support and analysis in one or more technical program areas.

b. Work Environment. Persons in these occupational groups work in centralized facilities and in an office environment.

c. Nature of Work. Persons in these occupations normally work during daytime hours. Administrative duties consist of a variety of tasks, some of which must be done repetitively. Employees in these work groups will necessarily have a high degree of interpersonal contacts, which include attending conferences and coordinating project or program functions. In the secretarial field, employees will be required to coordinate office functions with other groups, initiate and receive telephone calls, and perform receptionist duties.

4/7/76

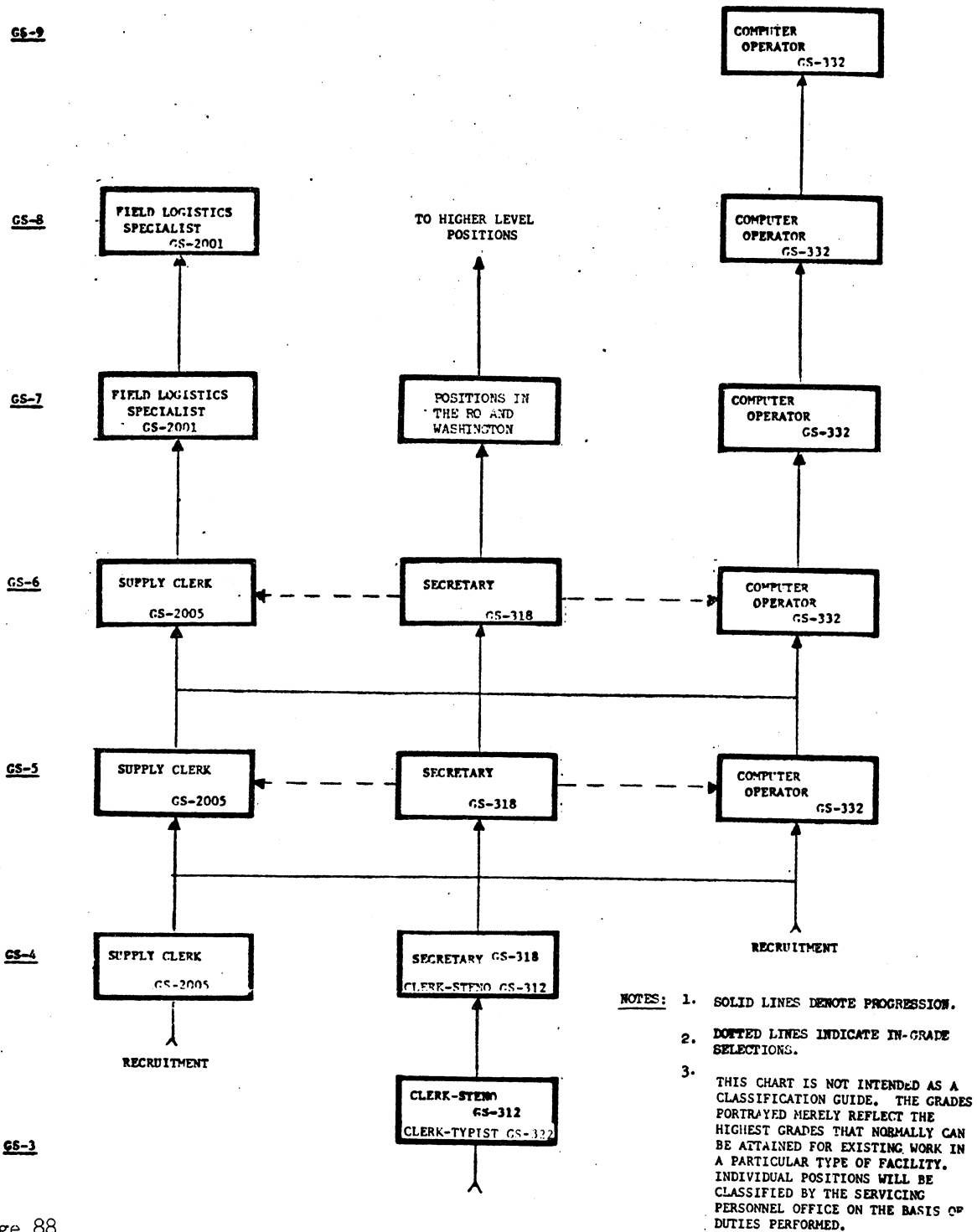
80. CAREER GOALS AND OPPORTUNITIES. Career goals vary considerably among the occupational groups within this career system.
- a. Secretaries (GS-318), Clerk-Stenos (GS-312), Clerk-Typists (GS-322). The secretarial career ladder in Airway Facilities generally peaks at the GS-6 level in the sector, the GS-7 level in the regional office, and the GS-9 level in Washington headquarters. Specific grades are determined by the organizational level of the supervisor and the nature of duties and responsibilities assigned to the individual.
 - b. Administrative Assistant (GS-301) and Administrative Officers (GS-341). Administrative Assistants can realistically progress to the GS-8 and GS-9 grade levels. Administrative Officers continue a progression line to the GS-11 grade level in the regional office and Washington headquarters, although there are only a limited number of positions at these locations.
 - c. Fiscal Clerks (GS-501) and Budget Analysts (GS-560). This field is very limited in the number of employees within Airway Facilities. Fiscal Clerks can advance to the GS-9 grade level while Budget Analysts can attain the GS-12 and GS-13 grade levels at Washington headquarters.
 - d. Management Technicians (GS-344), Management Analysts (GS-343), and Program Analysts (GS-345). This group of managerial support employees constitutes a small but vital segment of the work force at the regional office and Washington headquarters. Program analysts can achieve grades GS-11 and GS-12 in certain program areas.
81. CAREER PROGRESSION. (See Figures 9-1 and 9-2.) Career progression for this composite group of occupations range from GS-2 to GS-13. There are, however, several career transitions which an employee must accomplish to achieve progression through this range. The secretarial/administrative occupations generally cover the range GS-2 to GS-6, with a few positions at higher grades as administrative assistants. Employees in this group are encouraged to seek ways to achieve training and experience, which will enable them to qualify for management technician, management analysts, and program analysts positions at the entry level. Progression in these occupations continues to the GS-13 level. Job qualification standards, position descriptions, and position classification guides are excellent sources for describing what is required and expected in the various occupational series and at each grade level therein. Persons in these occupations should explore opportunities in technical career fields, especially through such means as the Upward Mobility Program, and other equal employment

opportunities available within the Service and the FAA. In addition, it is incumbent on all supervisors and managers to assure that all employees in the administrative and managerial support work force are afforded every opportunity to develop additional skills and knowledges which are needed to qualify for higher-level career fields.

82. OCCUPATIONAL REQUIREMENTS. These requirements focus primarily on the specialized training and experience needed to perform the job. Employees entering the various administrative fields will be required to meet basic qualification requirements. In most instances, the employee's basic skills will be further developed through on-the-job training rather than through specialized formal training programs. The employee's interests in learning will serve as the catalyst for advancement to jobs in other fields and/or jobs of higher responsibility.

4/7/76

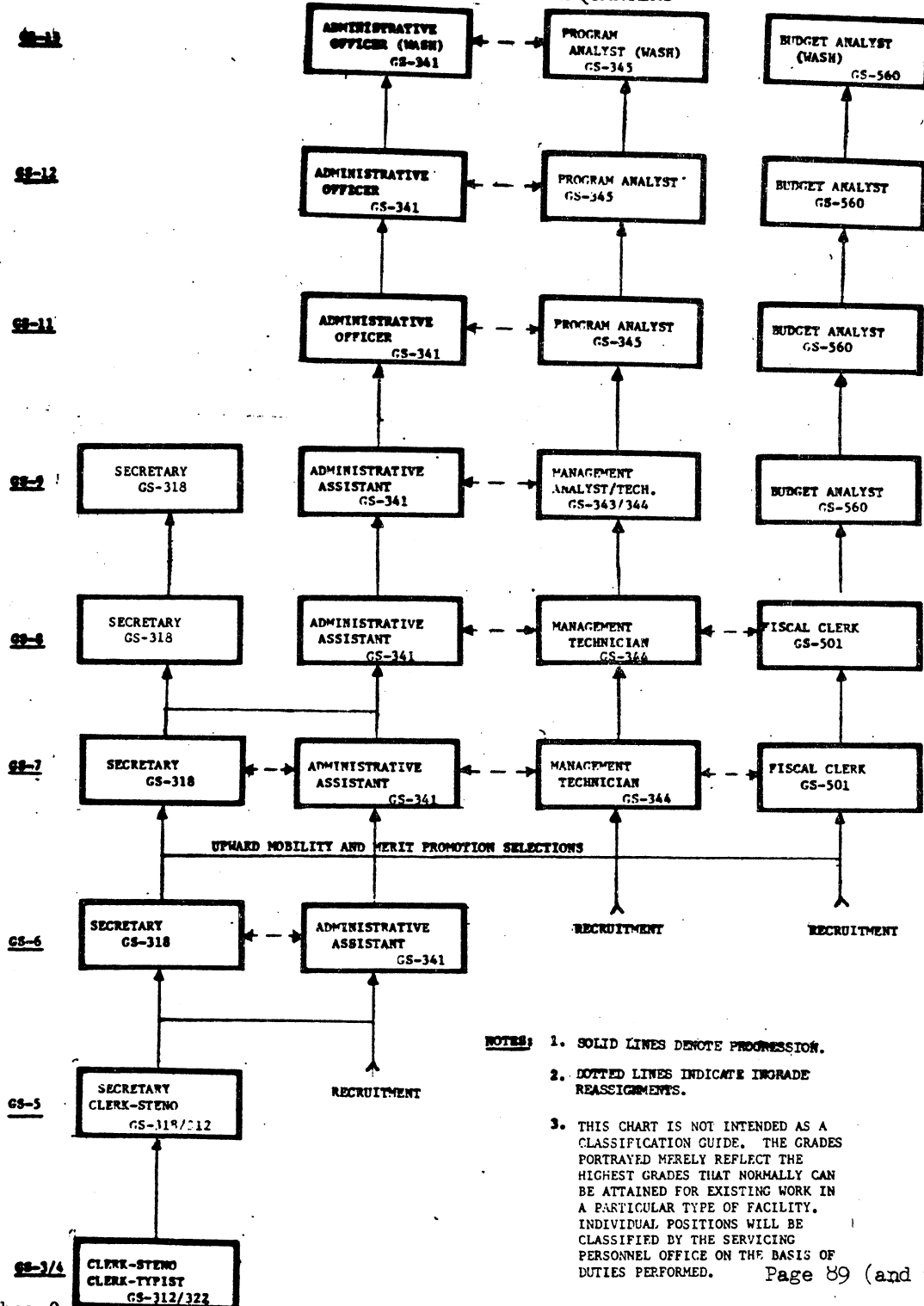
FIGURE 9-1. ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS:
CAREER PATTERNS WITHIN FIELD SECTORS



4/7/76

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FIGURE 9-2. ADMINISTRATIVE AND MANAGERIAL SUPPORT OCCUPATIONS:
CAREER PATTERNS WITHIN THE REGIONAL OFFICES/
CENTERS AND WASHINGTON HEADQUARTERS



CHAPTER 10. CAREER SYSTEMS FOR TECHNICAL MANAGERS

83. INTRODUCTION. Technical management in Airway Facilities consists of division and assistant division chiefs, staff chiefs, branch chiefs, and sector managers/assistant sector managers. These positions are classified at the GS-14 grade level and above. They require the highest degree of technical and managerial talents. Technical management positions are available in AF sectors, regional offices, and Washington headquarters.
84. CAREER DEVELOPMENT. Primary career development of technical managers takes place at the first and second supervisory levels in the functional areas of engineering. A sound engineering background is highly desirable for technical managers. In addition, multifunctional development in engineering is essential to enhance career opportunities. See Figure 10-1 for normal progression lines in this field.
- a. Sector Managers (GS-15/14). Candidates for these positions normally emerge from lower grade sector supervisory personnel, and from technical personnel from the regional office and Washington headquarters. Individuals selected for these positions are assigned extensive technical responsibility for the major electronics and environmental systems comprising the National Airspace System (NAS). In addition, they are assigned a high degree of personnel and program responsibility including effective utilization of manpower and other resources, timely completion of program assignments, and adherence to safety and security policies. They are primarily responsible for the continued safe and reliable operation of all NAS systems within their purview.
 - b. Branch Chiefs (GS-15). Candidates for these positions are drawn from section chiefs, program and project engineers, sector managers and assistant technical staff personnel, and other branch chiefs and assistants. Selection criteria for these positions encompass a high degree of engineering experience and demonstrated managerial abilities. Selection factors are weighted to encourage functional and geographic mobility; i.e., combinations of experience in Washington, regional office, and field. Branch chiefs are assigned a high level of personnel, program, and fiscal responsibility. Decision-making at this level is highly critical to all aspects of program execution and implementation.
 - c. Staff Chiefs (GS-15). Candidates for staff chief positions are normally drawn from staff assistants in the same or related specialty, from branch and section chiefs, and from engineers experienced in their particular staff function. Individuals in these positions are assigned a high level of program responsibility including program evaluation and analysis, administrative and technical support of line functions, program control and coordination, and management advisory duties. Staff Chiefs are responsible

for F&E and maintenance program evaluation, frequency management, baseline and configuration control of all NAS facilities, systems, subsystems and equipment, and executive staff and administrative functions. Staff chiefs at Washington headquarters are classified at the GS-15 grade level.

- d. Division Chiefs/Assistants (GS-16/15). Division chiefs are selected by means of a special executive selection process. Nominees must possess the highest managerial qualifications augmented by a broad technical and engineering background. Individuals at this level manage and direct all Airway Facilities programs within their assigned purview.
- (1) Regional division chiefs are responsible for Airway Facilities maintenance, inspection, evaluation, establishment, and allocation of divisional resources covering several states. In some regions, these responsibilities extend to overseas facilities and organizations. They administer national programs throughout their respective region.
 - (2) At Washington headquarters, division chiefs are responsible for planning and developing new Airway Facilities programs, as well as modifying existing ones, to satisfy and accomplish mission objectives. They analyze and evaluate effectiveness of both current and future maintenance and establishment programs. In addition, they assess, recommend, and determine fiscal allocations; establish manpower requirements and utilization; determine training requirements and training programs; plan and execute management systems; and they manage the design, development, and implementation of new equipment and systems.
85. DESIRABLE COMBINATIONS OF EXPERIENCE. Diversity of experience in different functions and environments is highly desirable as a foundation for progression to high level technical management positions. Mobility significantly increases an individual's management expertise, and awareness and understanding of the overall program. Managers must be experienced in various phases of the program cycle; i.e., planning, budgeting, procuring, implementing, evaluating, etc. In addition, it is highly desirable that they have experience in two or more program areas and have served at more than one organizational level. For the purpose of this document the following organizational levels are defined:
- a. Washington Headquarters. Includes all AF Divisions and all related technical organizational levels at headquarters including the Systems Research and Development Service and NAFEC.

- b. Regional. Includes all Airway Facilities organizational levels throughout the regional jurisdiction.
 - c. Regional Office. Includes all Airway Facilities organizational levels in the regional office including former area and district offices.
 - d. Aeronautical Center. Includes all related Airway Facilities organizational elements; i.e., FAA Academy, Airway Engineering Support Divisions, and the FAA Depot.
86. RANKING CRITERIA FOR SELECTING TECHNICAL MANAGERS. The following areas are evaluated in making technical manager selections. Selecting officials should refer to Order 3330.1A, Merit Promotion Plan (Appendix 11), and Order 3330.38, Selection of Key Personnel.
- a. Education. Usually technical manager positions require an educational background in engineering. Most positions require a Bachelor of Science degree, or equivalent in one of the engineering disciplines; i.e., electronics, civil, electrical, or mechanical. Technical managers are encouraged to pursue college and graduate level studies in engineering and in curricula directed toward public administration and management.
 - b. Training. Technical managers receive specialized training at the FAA Academy, the Management Training School, and the FAA Executive School. Additional courses are offered for Washington headquarters personnel at the Department of Agriculture Graduate School, and selected course offerings by the Department of Defense.
 - c. Experience. Diversification of experience is a highly desirable characteristic when evaluating technical manager qualifications. Outlined below are the combinations of experience considered highly desirable for technical managers:
 - (1) Sector Manager/Assistant Sector Manager (GS-15/14).
 - (a) A minimum of four years regional experience at the GS-11 level or above. At least two of the four years must have been in the regional office at the GS-11 grade level or higher.
 - 1 Up to two years of regional office experience may be substituted with Washington headquarters experience at the GS-11 level or above.

- 2 Up to two years of regional office experience may be substituted with Aeronautical Center experience at the GS-11 level or above.

(b) Experience in maintenance is highly desirable.

(2) Branch Chief, Regional Office (GS-15).

- (a) A minimum of two years Washington headquarters experience at the GS-11 level or above.
- (b) A minimum of two years regional experience at the GS-11 level or above.
- (c) Aeronautical Center experience at the GS-11 level or above may be substituted for regional experience.
- (d) Functional experience in the related program area.

(3) Branch Chief - Washington Headquarters (GS-15).

- (a) A minimum of two years regional experience at the GS-11 level or above.
- (b) Aeronautical Center experience at the GS-11 level or above may be substituted for regional experience.
- (c) Functional experience in the related program area.

(4) Staff Chief - Washington Headquarters (GS-15).

- (a) A minimum of two years regional experience at the GS-11 level or above.
- (b) Aeronautical Center experience at the GS-11 level or above may be substituted for regional experience.
- (c) Functional experience in the related program area.

(5) Division Chief/Assistant-Regional Office (GS-16/15).

- (a) A minimum of two years experience at Washington headquarters at GS-11 grade, or above.
- (b) A minimum of three years regional experience, at the GS-11 grade, or above. Two years of this total must have been in the regional office.

- (c) Experience at the Aeronautical Center at the GS-11 level or above may be substituted for one year of regional experience.
- (d) Experience in both maintenance and establishment is highly desirable. In addition, applicant should have a good knowledge and understanding of both electronics and environmental fields and must have the ability to manage a major program.

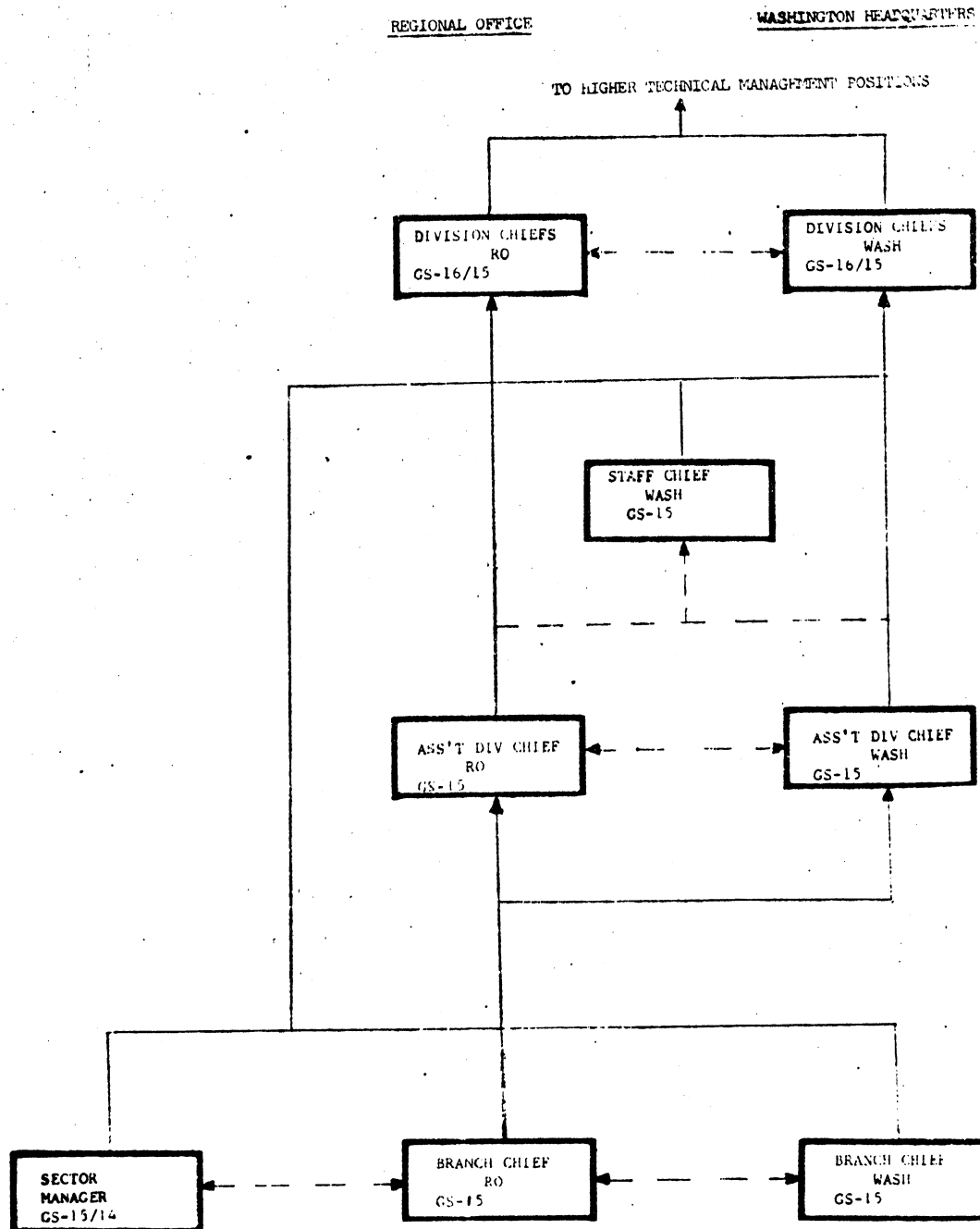
(6) Division Chief/Assistant - Washington Headquarters (GS-16/15)

- (a) A minimum of two years Washington headquarters experience at the GS-11 level or above.
- (b) A minimum of three years regional experience at the GS-11 level or above. Two years of this total must have been in the regional office.
- (c) Experience at the Aeronautical Center at the GS-11 level or above may be substituted for one year of regional experience.
- (d) Experience in both maintenance and establishment is desirable. In addition, applicant should have a good knowledge and understanding of both electronics and environmental fields must have the ability to manage a major program.

87. MOBILITY ACROSS SERVICE LINES. Traditionally, technical managers in Airway Facilities have advanced to key managerial positions in other offices and services at Washington headquarters. The Office of Systems Engineering Management, the Office of Budget, the Office of Personnel and Training, the Office of International Aviation Affairs, the Office of Aviation Policy, the Office of Aviation System Plans, the System Research and Development Service, the Airport Service, the Logistics Service, and the Flight Standards Service are prominent organizations that employ former Airway Facilities technical personnel.

4/7/76

FIGURE 10-1. TECHNICAL MANAGERS: CAREER PATTERNS

**NOTE:**

THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES THAT NORMALLY CAN BE ATTAINED FOR EXISTING WORK. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE ON THE BASIS OF DUTIES PERFORMED.

Chap 10
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CHAPTER 11. INTERFACE OF AIRWAY FACILITIES CAREER SYSTEMS
WITH THOSE IN OTHER ORGANIZATION

88. INTRODUCTION. The Airway Facilities Service is composed of many occupations which are also found in other offices and services. The agency recognizes that highly desirable benefits are derived from career movement across organizational lines. For example, such movement stimulates individual self-development, increases available channels of career progression, and helps to develop individuals with broad, multidiscipline backgrounds, which are highly desirable for top level management positions.
89. CAREER INTERFACE WITH THE AERONAUTICAL CENTER. Many Airway Facilities occupations are closely aligned with career fields at the Aeronautical Center. Commonality of occupations, skill training, and experience exists in the FAA Academy, the FAA Depot, the Airway Engineering Support and Plant Engineering divisions, and the Aircraft Services Base.
- a. FAA Academy. (See Figures 11-1 and 11-2.) Instructor assignments offer many career opportunities and advantages to Airway Facilities employees in the electronics and environmental career systems. Such assignments provide: valuable instructional and administrative experience; supervisory and management training; a comprehensive knowledge of the AF training program; and increased educational and administrative experience. Historically, such assignments have served as a stepping stone to management positions within Airway Facilities.
- (1) Tours of Duty. Instructors are selected for two-year duty assignments. Agreements may be renewed twice, which allows up to six years at the Academy. Employees may exercise return rights to their parent region at the end of the first and second tours. Return and reemployment rights are subject to change and employees should periodically refer to Order 3330.29, entitled, "FAA Academy Instructor Selection, Training and Career Development," for current policy information.
- (2) Type of Work. Instructor's duties are highly varied and include preparation of and use of training materials and aids, classroom and laboratory lectures, selection and administration of tests, and supervision of students in technical areas.
- (3) Instructor Selection, Training and Career Development. Regional AF divisions must play an active role in the screening of applications for instructor positions. Only highly competent journeyman engineers and technicians should be nominated to the Academy for selection. The Academy career system, including job requirements and instructor duties, should be fully explained to nominated candidates. Career plans for the candidate's reassignment after completing the Academy tour should be developed as much as possible during the planning and counseling session prior to the employees' nomination to the FAA Academy.

- b. The FAA Depot provides a staging service for equipment and material, supply support for all operating facilities, and central engineering shops for technical logistics support for Airway Facilities equipment and systems. Employees at the FAA Depot perform assignments that are closely related to those performed by Airway Facilities personnel in certain other occupations. The logistics career field is closely aligned to the AF logistics function and can be utilized for extended career avenues for all logistics employees (see Chapter 8). Electronics technicians, program analysts, and computer operators and programmers may also desire career movement to the FAA Depot. (See Figure 11-3.)
 - c. Airway Engineering Support and Plant Engineering Divisions. (See Figure 11-3.) Engineers and technicians employed in these divisions perform highly technical assignments involving equipment and system modification, engineering design and analysis, contract specifications, feasibility studies, performance testing, and procurement. These divisions are considered extensions of Airway Facilities engineering divisions, and their functions are virtually identical to those in AF when comparing the type, nature, and level of engineering work. Employees in these divisions at the Aeronautical Center shall have equal progression opportunities in Airway Facilities.
 - d. Aircraft Services Base. Personnel in this organization perform essential functions maintaining the flight inspection fleet. Many of the occupations are similar to work components in Airway Facilities. Avionics electronics technicians, in particular, possess comparable skills and knowledge found in the AF maintenance technician work force. Career opportunities for both organizations should be made available through an exchange of Merit Promotion vacancy announcements. Such a career interface could be mutually beneficial to the separate organizations as well as providing additional career options for the employees.
90. CAREER INTERFACE WITH NAFEC. There are several hundred employees at NAFEC in various technical and technical support occupations similar to those in Airway Facilities. Functional responsibilities at NAFEC are divided among several divisions, which are engaged in research, test, experimentation, analysis, and design of nav aids, communications, radar, and automated systems utilized in air traffic control operations. There is a high degree of commonality between certain AF occupations and NAFEC. Computer operators, programmers, and systems analysts share parallel career systems. Interchange of these employees can be advantageous to the agency and to the employee's career development. Electronics technicians and engineers, engineering technicians, program analysts, and computer operators should investigate career opportunities within Airway Facilities and NAFEC for comparison and career enhancement (see Figure 11-3).

91. CAREER INTERFACE WITH THE AIRPORTS SERVICE. Although there has been a very low rate of interchange between employees in Airway Facilities and Airports, such movement should be encouraged and stimulated. The Airports Service employs civil, aeronautical, and general engineers in positions related to those in Airway Facilities. Rotational assignments for one to two years would greatly increase functional knowledge and organizational awareness between these two vital Services (see Figure 11-4).
92. CAREER INTERFACE WITH THE SYSTEMS RESEARCH AND DEVELOPMENT SERVICE. Engineers employed by the Systems Research and Development Service (ARD) perform essential engineering functions during the design and development stages of new equipment and systems that complement those performed by Airway Facilities counterparts. Obviously, there is a great deal of interest between Airway Facilities Service and the Systems Research and Development Service. Although no return and reemployment rights exist, there shall be equal opportunities for career progression between these two Services. ARD occupational fields are considered to be in the same category when applied to Airway Facilities career systems (see Figure 11-4).
93. CAREER INTERFACE WITH THE LOGISTICS SERVICE. There is a continuing and increasing need to stimulate movement between Airway Facilities and the Logistics Service. Chapter 8 describes the career relationships between the AF logistics career field and the expanded fields in the Logistics Service. This interface, by necessity, must be viable and functionable. In addition, there is commonality between electronics technician occupational fields in AF and the quality assurance function in Logistics. Many Airway Facilities technicians transfer and progress to Quality Reliability Officers (QRO's) within the Logistics Service. These QRO employees perform highly technical and specialized duties inherent to new equipment and systems design, procurement, production, testing, and acceptance. They perform analysis, evaluation, and inspection of production equipment from the standpoint of operational capability, design intent, reliability, maintainability, life cycle expectancy, and logistics support. QRO's shall be extended equal opportunity to apply for AF position vacancies and be allowed up to one year to meet specialized training or update training requirements. The area of consideration for AF technician vacancies shall be extended to include the Logistics Service for positions at grades GS-11 and above in Airway Facilities. (See Figure 11-5.)
94. CAREER INTERFACE WITH THE OFFICE OF INTERNATIONAL AVIATION AFFAIRS. International aviation assistance programs are expanding rapidly in various occupational fields employed in Airway Facilities. There will be an increasing need for Airway Facilities employees to serve at overseas locations. Some of the prime career specialties, which are period-

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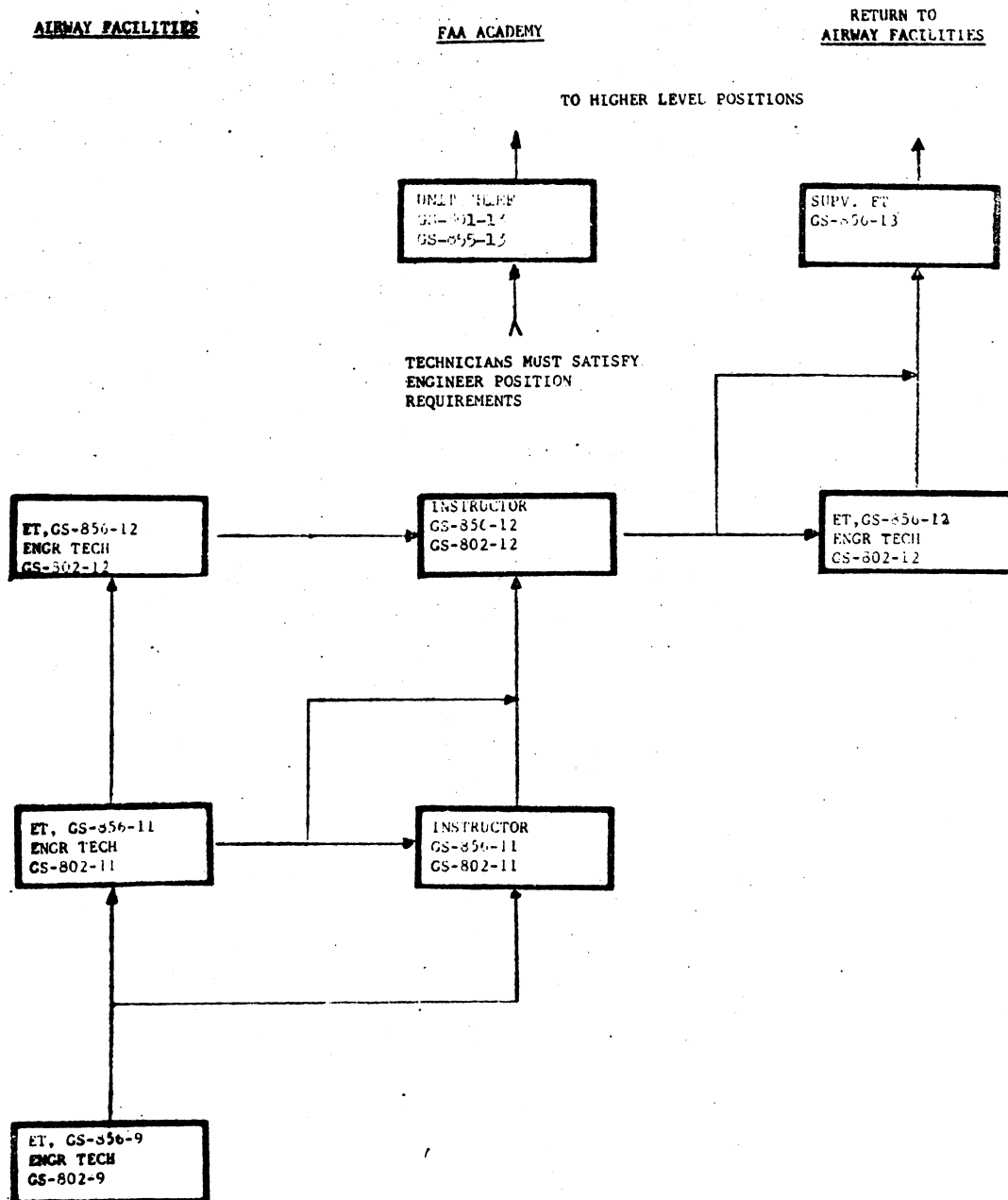
ically in demand are: engineers in AF disciplines; electronics technicians; computer operators, programmers, and analysts; administrative assistants and officers, and program analysts; and various types of technical managers, manpower and training officers, and instructors. Location of assignments will be concentrated in the Middle East, Europe, and Africa with continuing programs in Asia and South America. Normally, positions are advertised by areas of specialization and geographic environments. Second languages are sometimes required. Tours of duty range from temporary assignments to contracts covering two-year periods. Pay and fringe benefits usually offset dislocation expenses and inconveniences incurred at foreign posts. Career advantages to be realized from overseas assignments include: position enlargement, which usually covers several program functions; experience in negotiating with foreign nationals on program matters; and experience gained working with people of different cultural backgrounds. (See Figure 11-6.)

95. CAREER INTERFACE WITH OTHER OFFICES AND SERVICES. In addition to the career interfaces described in the preceding paragraphs, Airway Facilities does have infrequent interchange of personnel with Flight Standards, the Office of Personnel and Training, the Office of Management Systems, the Office of Budget, the Office of Aviation Policy, the Office of Aviation System Plans and the Office of Systems Engineering Management. Most of the interchange across these organizational lines are in management positions in which the individual has applied both broad and specialized experience.
96. - 99. RESERVED.

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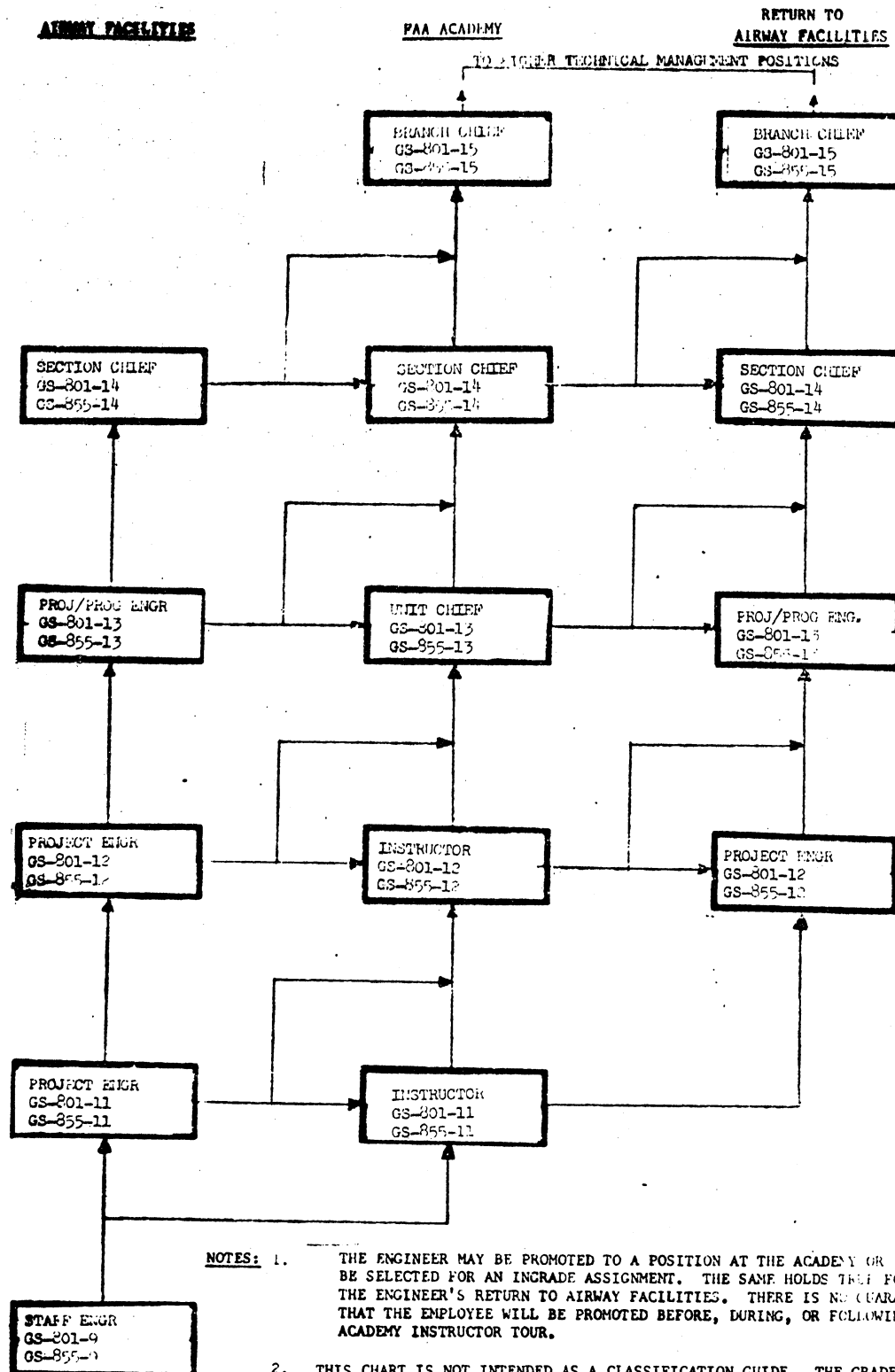
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FIGURE 11-1. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE FAA ACADEMY: TECHNICIANS (GS-802 and GS-856)



- NOTES:**
1. TECHNICIANS MAY OR MAY NOT BE PROMOTED BEFORE, DURING, OR FOLLOWING AN ACADEMY INSTRUCTOR ASSIGNMENT.
 2. THIS CHART IS NOT INTENDED AS A CLASSIFICATION GUIDE. THE GRADES PORTRAYED MERELY REFLECT THE HIGHEST GRADES THAT NORMALLY CAN BE ATTAINED FOR EXISTING WORK. INDIVIDUAL POSITIONS WILL BE CLASSIFIED BY THE SERVICING PERSONNEL OFFICE ON THE BASIS OF DUTIES PERFORMED.

FIGURE 11-2. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE FAA ACADEMY: GENERAL AND ELECTRONIC ENGINEERS



4/7/76

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FIGURE 11-3. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND NAFEC AND BETWEEN AIRWAY FACILITIES AND THE AERONAUTICAL CENTER (EXCEPT FAA ACADEMY)

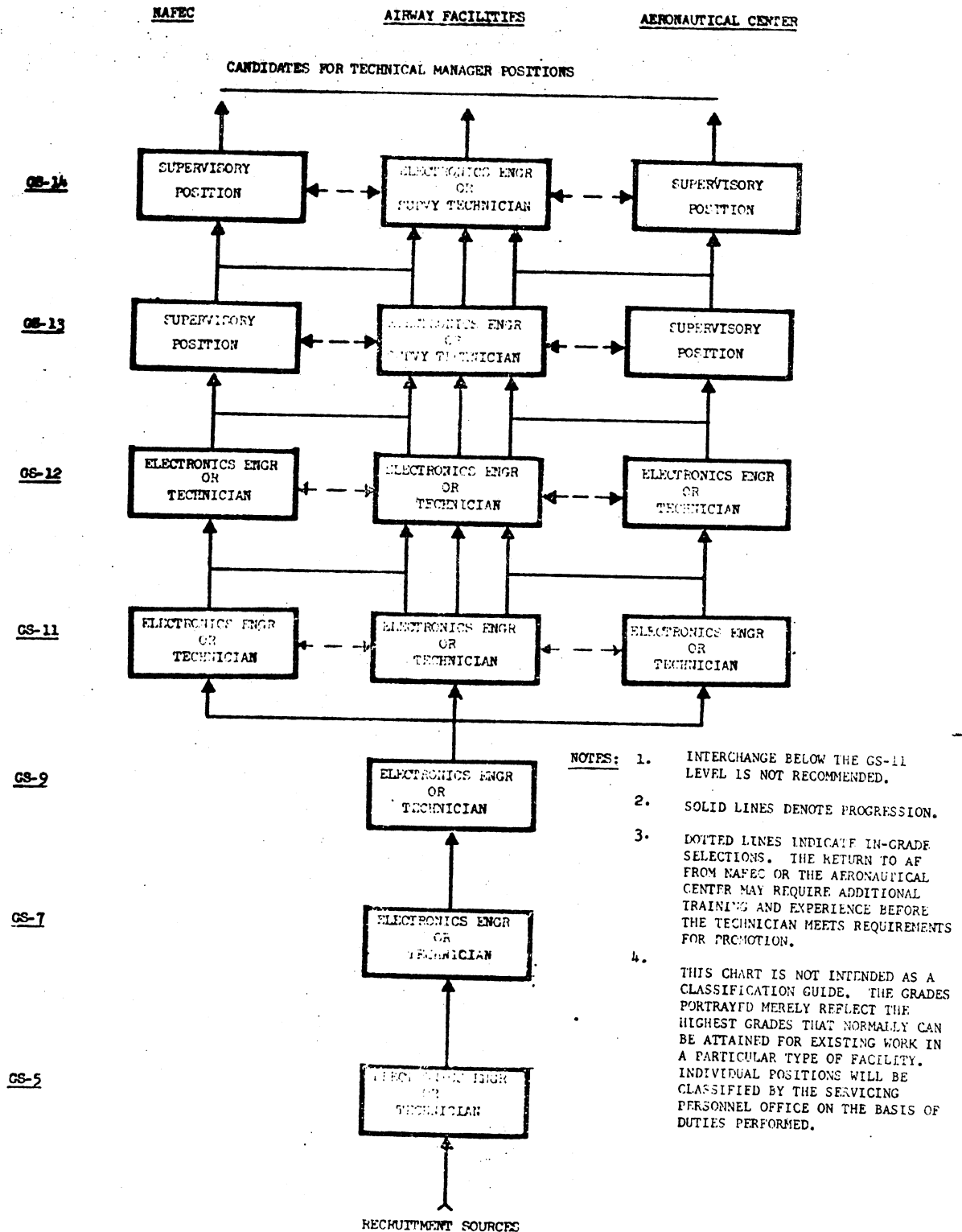
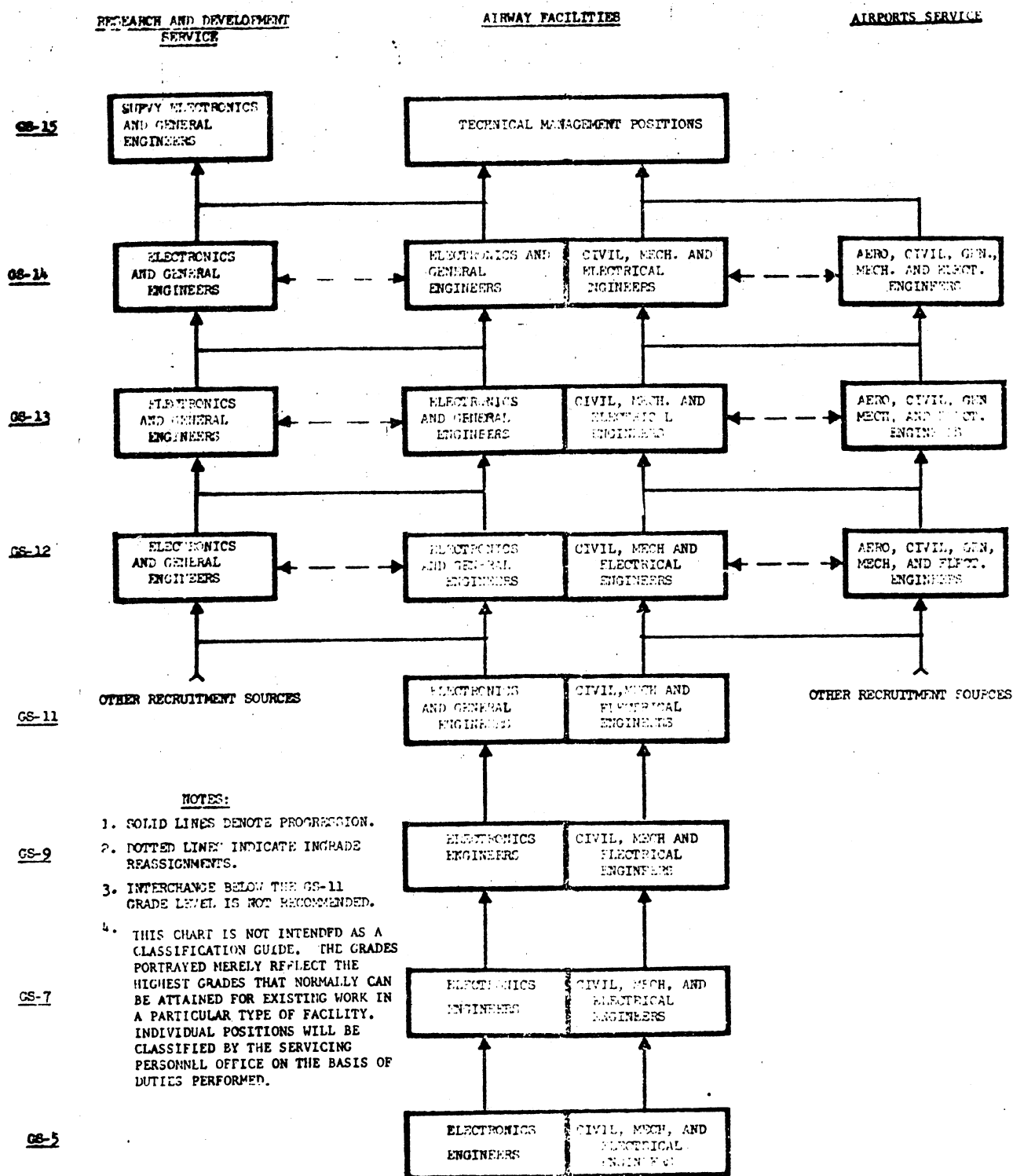


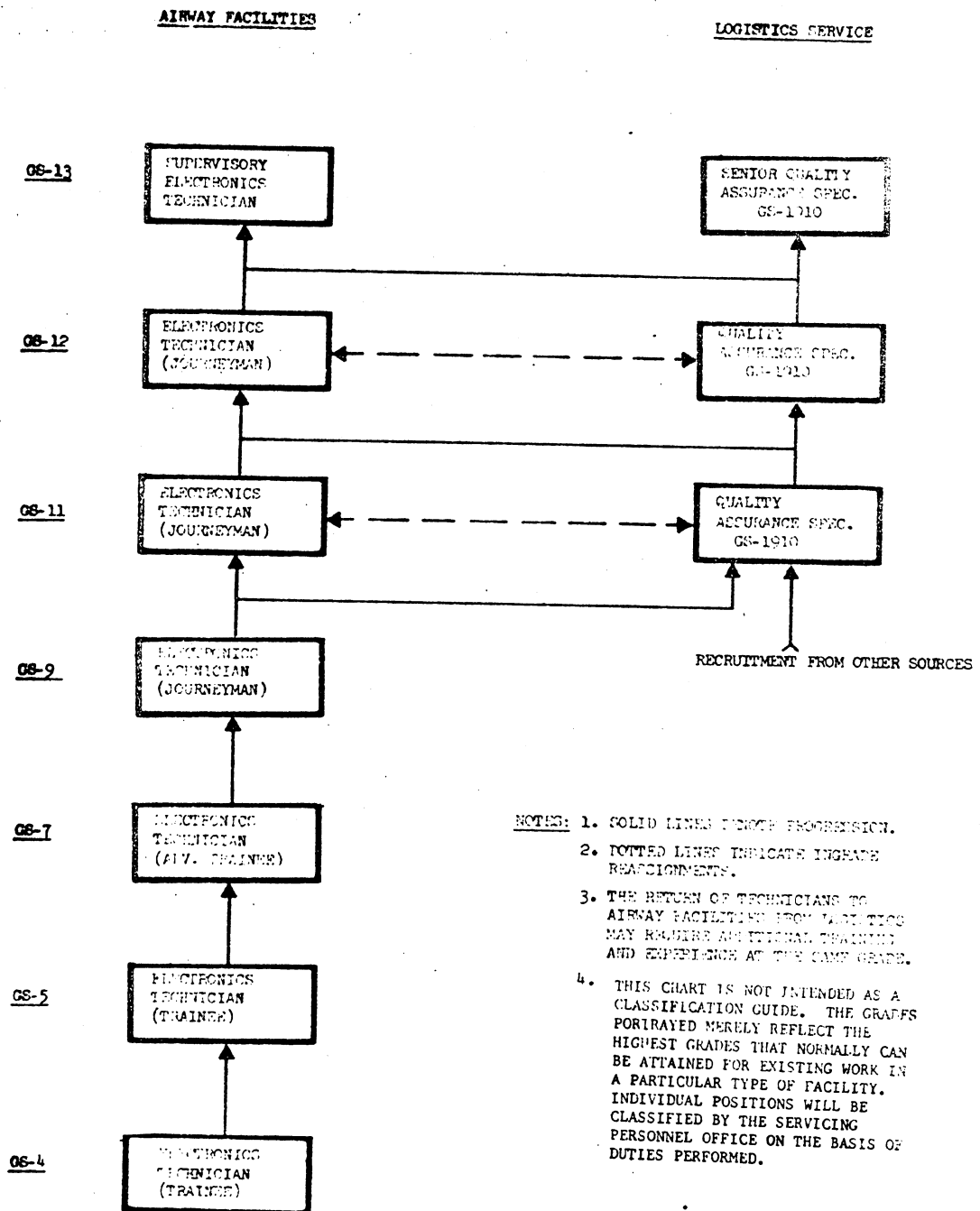
FIGURE 11-4. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE SYSTEMS RESEARCH AND DEVELOPMENT SERVICE AND BETWEEN AIRWAY FACILITIES AND AIRPORTS SERVICE



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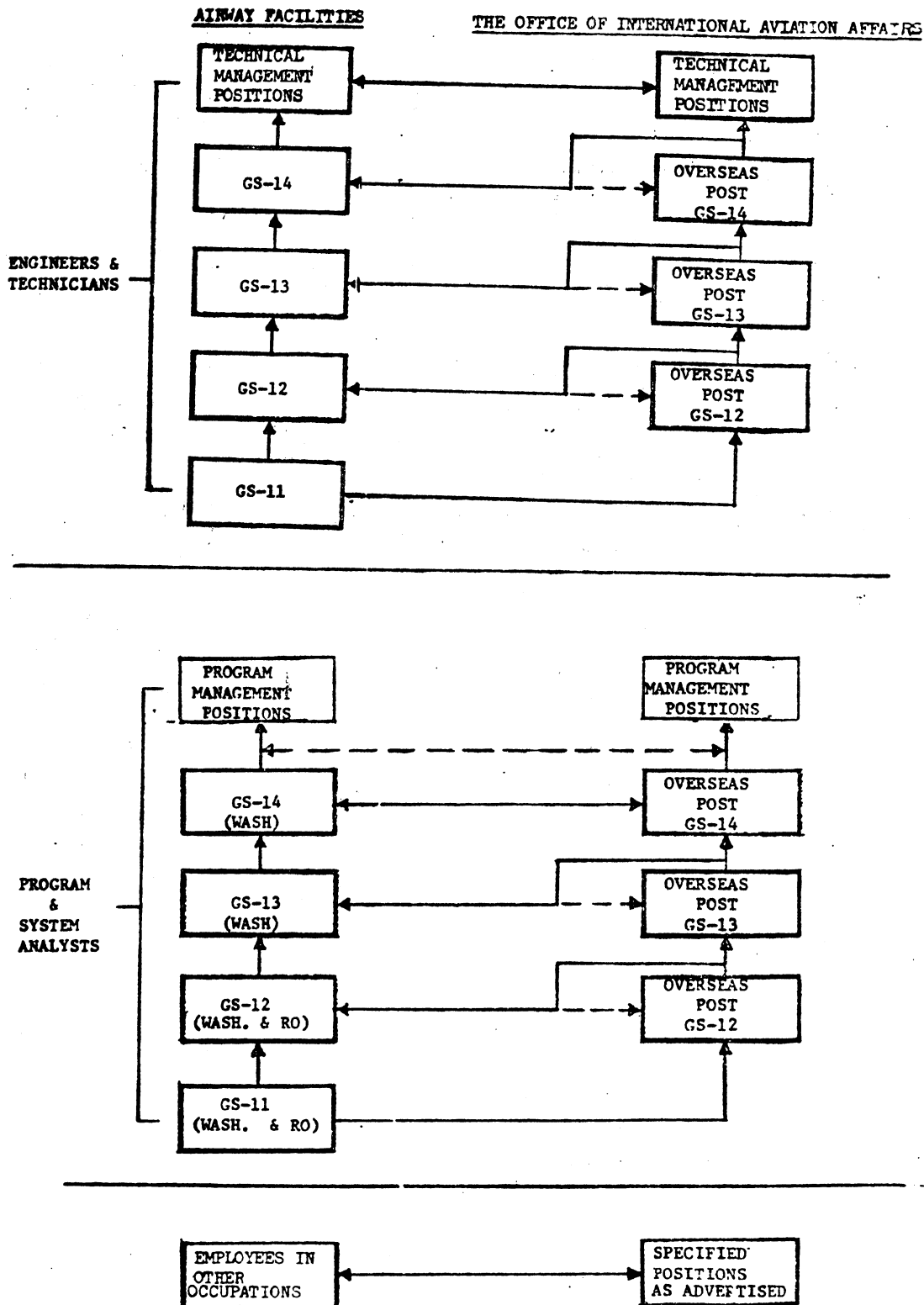
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FIGURE 11-5. CAREER INTERFACE BETWEEN AIRWAY FACILITIES ELECTRONICS TECHNICIANS AND THE LOGISTICS SERVICE QUALITY ASSURANCE SPECIALISTS



4/7/76

FIGURE 11-6. CAREER INTERFACE BETWEEN AIRWAY FACILITIES AND THE OFFICE OF INTERNATIONAL AVIATION AFFAIRS



4/7/76

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APPENDIX 1

APPENDIX 1. CAREER INVENTORY
as of 4/1/75
SECTION 1. COMPOSITE INVENTORY OF ALL AIRWAY FACILITIES OCCUPATIONS

SERIES	OCCUPATIONAL FIELD	TOTAL ALL JURISDICTION
GS-301	TECHNICAL MANAGERS	242
GS-301	ADMINISTRATIVE OFFICERS/GENERAL MANAGEMENT	117
GS-312	CLERK-STENO	293
GS-318	SECRETARIES	279
GS-322	CLERK TYPISTS	60
GS-332	COMPUTER OPERATORS	132
GS-334	COMPUTER SYSTEM ANALYSTS	33
GS-341	ADMINISTRATIVE OFFICERS	40
GS-343	MANAGEMENT ANALYSTS	7
GS-344	MANAGEMENT TECHNICIANS	5
GS-345	PROGRAM ANALYSTS	54
GS-393	COMMUNICATIONS SPECIALISTS	10
GS-501	ACCOUNTING CLERKS	7
GS-560	BUDGET ANALYSTS	13
GS-801	GENERAL ENGINEERS	274
GS-802	ENGINEERING TECHNICIANS, ENVIRONMENTAL SUPPORT	368
GS-802	ENGINEERING TECHNICIANS, CIVIL	26
GS-808	ARCHITECTS	3
GS-809	CONSTRUCTION REPRESENTATIVES	74
GS-810	CIVIL ENGINEERS	223
GS-818	ENGINEERING DRAFTSMEN	74

4/7/76

APPENDIX 1. CAREER INVENTORY
as of 4/1/75
SECTION 1. COMPOSITE INVENTORY OF ALL AIRWAY FACILITIES OCCUPATIONS

SERIES	OCCUPATIONAL FIELD	TOTAL ALL JURISDICTION
GS-830	MECHANICAL ENGINEERS	40
GS-850	ELECTRICAL ENGINEERS	43
GS-855	ELECTRONICS ENGINEERS	626
GS-856	ELECTRONICS MAINTENANCE TECHNICIANS	7566
GS-856	ELECTRONICS INSTALLATION TECHNICIANS	377
GS-1105	PURCHASING AGENTS	35
GS-1515	OPERATIONS RESEARCH ANALYSTS	2
GS-1520	MATHEMATICIAN	1
GS-1640	CONSTRUCTION SUPERINTENDENTS	3
GS-1641	BUILDINGS AND GROUNDS MANAGERS	1
GS-1670	EQUIPMENT SPECIALISTS	31
GS-2001	FIELD LOGISTICS SPECIALISTS	141
GS-2005	SUPPLY CLERKS	62
<u>1/</u> WG-4740	GENERAL FACILITIES AND EQUIPMENT TECHNICIANS	759
	OTHER WAGE GRADE EMPLOYEES	104
	OTHER GENERAL SCHEDULE EMPLOYEES	431
TOTAL	ALL AIRWAY FACILITIES EMPLOYEES	12,556

1/ The positions in this series will be reclassified under new Civil Service Commission Job Grading Standards.

4/7/76

Appendix 1

APPENDIX 1. CAREER INVENTORY

as of 4/1/75

SECTION 2. ELECTRONICS TECHNICIANS (GS-856)

I. AIRWAY FACILITIES ELECTRONICS MAINTENANCE TECHNICIANS.

a. Systems Engineers/Assistant Systems Engineers.

	ALL REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-14	28	-	1	6	6	3	-	-	5	-	6	1
GS-13	65	-	5	8	18	5	-	-	5	11	13	-
GS-12	5	-	-	-	1	-	-	-	2	-	1	1
TOTAL	98	-	6	14	25	8	-	-	12	11	20	2

b. Technical Program Management

	ALL REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-14	30	-	-	14	1	2	-	1	-	6	3	3
GS-13	236	-	8	77	7	3	10	4	10	35	6	76
GS-12	156	-	4	51	7	5	10	1	3	37	9	29
GS-11	3	-	-	2	-	-	-	-	-	1	-	-
TOTALS	425	-	12	144	15	10	20	6	13	79	18	108

c. Communications

	ALL REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-13/14	28	-	-	2	8	1	1	4	3	2	4	3
GS-12	305	7	6	30	80	10	-	22	9	51	67	23
GS-11	521	1	39	22	50	5	6	53	40	167	121	17
GS-9	74	-	21	2	1	5	1	5	2	25	11	1
GS-7	6	-	3	-	-	1	-	-	1	-	-	1
GS-5	3	-	3	-	-	-	-	-	-	-	-	-
TOTALS	937	8	72	56	139	22	8	84	55	245	203	45

4/7/76

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

ALL
REGIONS AAL ACE AEA AGL ANE ANW APC ARM ASO ASW AWE

d. NAVAIDS/COMMUNICATION

GS-13/14	67	-	3	13	14	3	2	-	1	16	10	5
GS-12	519	-	51	148	67	29	34	8	11	71	67	33
GS-11	567	-	58	98	40	17	109	4	100	60	38	43
GS-9	30	-	3	8	-	5	2	3	-	6	2	1
GS-7/5	4	-	-	-	2	-	2	-	-	-	-	-
TOTALS	1187	0	115	267	123	54	149	15	112	153	117	82

e. NAVAIDS

ALL
REGIONS AAL ACE AEA AGL ANE ANW APC ARM ASO ASW AWE

GS-13	11	-	-	-	3	2	-	1	-	1	4	-
GS-12	303	-	9	72	54	11	-	4	8	68	69	8
GS-11	305	-	20	37	46	2	3	8	6	90	92	1
GS-9	14	-	1	3	3	-	-	-	-	6	1	-
TOTALS	633	0	30	112	106	15	3	13	14	165	166	9

f. RADAR

ALL
REGIONS AAL ACE AEA AGL ANE ANW APC ARM ASO ASW AWE

GS-13/14	111	1	8	12	22	2	1	-	7	19	30	9
GS-12	987	6	26	134	136	27	44	17	69	191	232	105
GS-11	164	1	4	15	14	8	3	1	6	60	48	4
GS-9	24	-	5	1	1	1	2	1	-	11	1	1
GS-7	3	-	-	-	-	-	3	-	-	-	-	-
TOTALS	1289	8	43	162	173	38	53	19	82	281	311	119

g. RADAR/COMMUNICATIONS

ALL
REGIONS AAL ACE AEA AGL ANE ANW APC ARM ASO ASW AWE

GS-13/14	51	-	8	6	13	9	1	1	-	5	8	-
GS-12	527	-	46	48	66	8	54	10	78	99	32	76
GS-11	136	-	6	20	6	5	4	6	24	56	3	6
GS-9	20	-	-	-	2	1	2	3	-	9	1	2
GS-7/5	3	-	-	-	-	-	1	-	-	2	-	-
TOTALS	737	-	60	74	87	33	62	20	102	171	44	84

4/7/76

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Appendix 1

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

ALL												
REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE	

h. AUTOMATION

GS-13/14	128	-	9	2	23	6	6	-	16	34	21	11
GS-12	468	-	35	63	77	14	20	5	33	130	48	43
GS-11	25	-	3	4	1	1	-	1	1	10	4	-
GS-9	12	-	2	-	1	2	-	-	4	3	1	1
GS-7/5	10	-	-	-	1	3	-	-	2	-	-	2
TOTALS	643	0	49	69	103	26	26	6	56	177	74	57

i. GENERAL & OTHER

ALL												
REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE	
GS-13/14	119	-	4	2	37	2	11	1	25	20	9	8
GS-12	530	-	49	35	118	33	25	3	36	46	17	167
GS-11	394	-	15	16	68	11	9	4	53	44	13	161
GS-9	286	-	5	39	49	14	7	5	44	52	19	52
GS-7	116	-	1	30	24	1	4	-	14	28	8	6
GS-5	82	-	3	17	8	5	5	-	9	22	4	9
GS-4/3	27	-	3	4	4	1	3	-	1	6	1	4
TOTALS	1554	0	80	143	308	67	64	13	182	218	71	407

2. AIRWAY FACILITIES ELECTRONICS INSTALLATION TECHNICIANS

ALL												
REGIONS	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE	
GS-13	5	-	-	-	2	-	-	-	1	-	-	2
GS-12	52	1	5	9	18	3	2	-	8	-	-	6
GS-11	145	5	11	29	26	6	4	1	8	14	35	6
GS-9	102	7	2	20	8	4	4	2	10	22	10	13
GS-7	49	1	-	3	14	3	-	-	1	12	15	-
GS-5	24	-	-	2	9	-	2	-	1	7	3	-
TOTALS	377	14	18	63	77	16	12	3	29	55	63	27

4/7/76

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

SECTION 3. ENVIRONMENTAL SUPPORT SYSTEMS EMPLOYEES AND EQUIPMENT TECHNICIANS

1. AIRWAY FACILITIES ENGINEERING TECHNICIANS (GS-802).

	ALL REGIONS	AAL	ACE	AEA	AGL	ANW	ANE	APC	ARM	ASO	ASW	AWE
GS-13/14	1						1					
GS-12	49	2	-	12	5	6	6	-	2	3	7	6
GS-11	168	5	10	24	22	10	2	2	18	23	24	28
GS-10	2	-	-	1	-	-	-	1	-	-	-	-
GS-9	111	-	4	13	20	7	16	-	15	6	16	14
GS-8	0	-	-	-	-	-	-	-	-	-	-	-
GS-7	10	-	-	2	-	-	1	-	2	5	-	-
GS-5/3	27	2	-	-	-	-	-	-	-	25	-	-
TOTALS	368	9	14	52	47	23	26	3	37	62	47	48

2. GENERAL FACILITIES AND EQUIPMENT TECHNICIANS (WG-4740) 1/

	ALL REGIONS	AAL	ACE	AEA	AGL	ANW	ANE	APC	ARM	ASO	ASW	AWE
WG-4740-12	250	5	19	34	50	7	8	5	13	57	35	22
WG-4740-11	295	45	17	27	30	9	4	15	26	55	39	43
WG-4740-5/10	214	42	2	21	32	4	18	6	8	53	25	9
TOTALS	759	92	38	82	112	20	30	26	47	165	99	74

SECTION 4. ENGINEERS

1. GENERAL ENGINEERS (GS-801)

	ALL JURIS- DICTIONS	AAF	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-18	1	1	-	-	-	-	-	-	-	-	-	-	-
GS-17	1	1	-	-	-	-	-	-	-	-	-	-	-
GS-16	7	2	-	-	1	1	-	-	-	-	1	1	1
GS-15	68	19	3	6	5	5	5	6	1	5	4	4	5
GS-14	89	29	2	5	9	8	6	5	1	4	5	9	6
GS-13	79	1	6	3	11	4	9	6	3	7	2	16	11
GS-12	23	-	1	1	2	1	1	3	2	4	1	5	2
GS-11	6	-	-	-	1	-	-	-	-	1	2	-	2
TOTALS	274	53	12	15	29	19	21	20	7	21	15	35	27

1/ Will be reclassified to new series.

4/11/76

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APPENDIX 12. CIVIL ENGINEERS (GS-810)

	ALL JURIS- DICTIONS	AAF	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-14	6	3	-	-	-	-	-	-	-	1	1	1	-
GS-13	53	8	1	4	5	11	-	1	-	3	13	1	6
GS-12	62	1	5	2	9	6	1	6	1	6	15	5	5
GS-11	15	-	-	-	1	1	-	2	-	-	8	2	1
GS-9	18	-	-	-	5	1	2	1	-	-	4	1	4
GS-7	40	-	-	-	7	10	2	1	-	-	7	1	12
GS-5	29	-	-	2	7	1	1	1	-	2	7	-	3
TOTALS	223	12	6	8	34	30	6	12	1	12	55	11	36

3. MECHANICAL ENGINEERS (GS-830)

	ALL JURIS- DICTIONS	AAF	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-14	1	1	-	-	-	-	-	-	-	-	-	-	-
GS-13	10	2	-	2	-	2	-	-	-	-	3	-	1
GS-12	11	1	3	-	1	2	-	-	1	1	1	1	-
GS-11	5	-	-	-	-	-	-	1	1	-	3	-	-
GS-9	6	-	-	-	2	-	1	-	-	-	3	-	-
GS-7	4	-	-	-	1	1	-	-	-	-	1	1	-
GS-5	3	-	-	1	-	-	-	-	-	-	2	-	-
TOTALS	40	4	3	3	4	5	1	1	2	1	13	2	1

4. ELECTRICAL ENGINEERS (GS-850)

	ALL JURIS- DICTIONS	AAF	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-14	2	2	-	-	-	-	-	-	-	-	-	-	-
GS-13	15	4	1	2	-	2	-	-	-	-	3	1	2
GS-12	12	2	3	-	1	-	1	-	1	1	-	2	1
GS-11	7	-	-	-	1	2	-	-	-	-	3	1	-
GS-9	5	-	-	1	1	1	-	1	-	-	1	-	-
GS-7	1	-	-	-	1	-	-	-	-	-	-	-	-
GS-5	1	-	-	-	1	-	-	-	-	-	-	-	-
TOTALS	43	8	4	3	5	5	1	1	1	1	7	4	3

4/7/76

5. ELECTRONICS ENGINEERS (GS-855)

	ALL JURIS- DICTIONS	AAF	AAL	ACE	AEA	AGL	ANE	ANW	APC	ARM	ASO	ASW	AWE
GS-15/16	22	19	-	-	-	1	-	-	-	-	2	-	-
GS-14	156	60	1	7	3	18	1	9	1	5	25	12	14
GS-13	206	23	6	11	7	19	3	14	3	18	45	34	23
GS-12	113	8	10	5	17	11	4	3	4	13	19	9	10
GS-11	59	3	3	-	8	6	3	2	2	2	16	4	10
GS-9	25	-	-	1	3	3	-	-	1	-	14	-	3
GS-7	26	-	-	2	7	7	-	2	-	3	-	4	1
GS-5	17	-	-	3	4	3	-	-	-	-	3	4	-
TOTALS	626	113	20	29	49	68	11	30	11	41	124	67	61

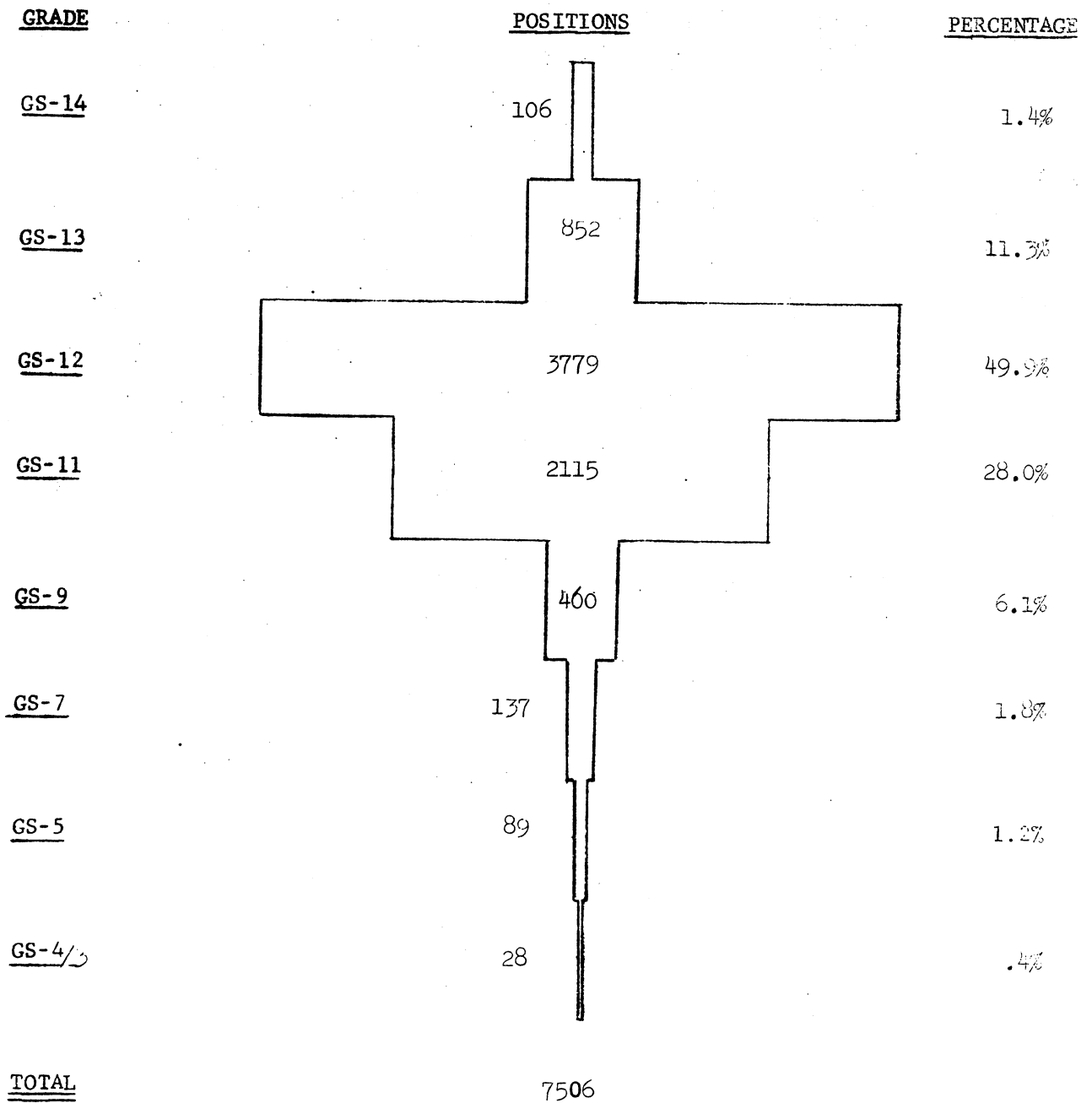
4/7/76

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Appendix

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

SECTION 5. CAREER ANALYSIS CHARTS

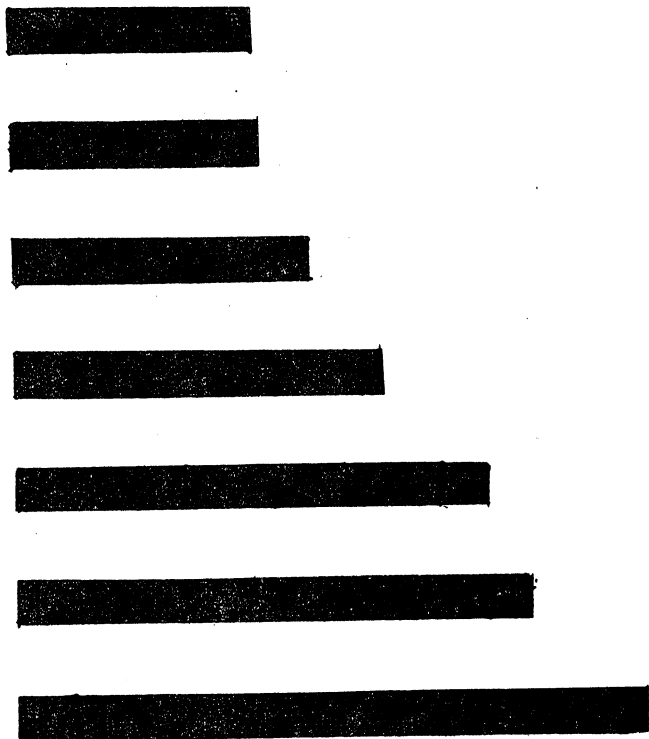
CHART 1. ELECTRONICS MAINTENANCE TECHNICIAN WORKFORCE DISTRIBUTION BY GRADE LEVELS



4/7/76

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

CHART 2. ELECTRONICS MAINTENANCE TECHNICIANS DISTRIBUTION BY OCCUPATIONAL SPECIALITIES: JOURNEYMAN (GS-12 AND BELOW)

<u>SPECIALTY</u>	<u>NUMBER</u>		<u>PERCENTAGE</u>
Nav aids	633		9.1%
Automation	643		9.2%
Radar/Gomm	737		10.6%
Communications	937		13.5%
Nav aids/Gomm	1187		17.0%
Radar	1274		18.3%
Gen/Other	1554		22.3%
TOTAL	6965		

4/7/76

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Appendix I

APPENDIX 1. CAREER INVENTORY AS OF 4/1/75

CHART 3. AIRWAY FACILITIES ENGINEERS: DISTRIBUTION OF WORKFORCE BY GRADES

<u>GRADE</u>	<u>NUMBER</u>		<u>PERCENTAGE</u>
GS-18	1		<.1%
GS-17	1		<.1%
GS-16	8	■	.6%
GS-15	93	■	7.4%
GS-14	273	■	21.6%
GS-13	399	■	31.6%
GS-12	220	■	17.4%
GS-11	93	■	7.4%
GS-9	53	■	4.2%
GS-7	71	■	5.0%
GS-5	50	■	4.0%
<u>TOTALS</u>	1202		

4/7/76

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Appendix 2

APPENDIX 2. GLOSSARY OF ACRONYMS FOR AIRWAY FACILITIES SYSTEMS

ARSR - Air Route Surveillance Radar

ARTCC - Air Route Traffic Control Center

ARTS - Automated Radar Terminal System

ASR - Airport Surveillance Radar

BRITE - Bright Radar Indicator Terminal Equipment

BUEC - Backup Emergency Communications

CCC - Computer Display Channel

CD - Common Digitizer

DCP - Display Channel Processor

DF - Direction Finder

DME - Distance Measuring Equipment

FSS - Flight Service Station

IFSS - International Flight Service Station

ILS - Instrument Landing System

RATCF - Radar Air Traffic Control Facility

RML - Radar Microwave Link

SECRA - Secondary Radar

TRACAB - Terminal Radar Approach Control in Tower Cab

VOR - Very High Frequency Omnidirectional Range

VORTAC - Very High Frequency Omnidirectional Range/Tactical Air Navigation

